

# **FACILITY RESPONSE PLAN**

**JUNE, 2007**



5555 North Channel Avenue • Portland, Oregon USA 97217  
(503) 285-1111 • [www.casgen.com](http://www.casgen.com)

**USEPA SF**



**1363882**



*Verification of plan, and incorporated contingency plans*

The undersigned verifies acceptance of this and any incorporated contingency plan by Cascade General, Inc., and

*Commitment of plan execution*

The undersigned commits to the execution of this and any incorporated contingency plans by Cascade General, Inc., as well as verifies the authority for Cascade General, Inc., to make appropriate expenditures to execute this plan.

A handwritten signature in dark ink, appearing to read 'T. Alan Sprott', written over a horizontal line.

T. Alan Sprott  
Vice President

Cascade General, Inc.

June, 2007

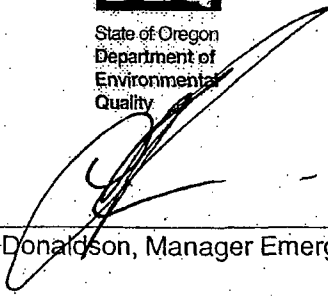
The Facility Oil Spill Contingency Plan For

Cascade General  
5555 North Channel Avenue  
Portland, Oregon 97217

Has been APPROVED pursuant to Oregon  
Revised Statutes 468B.300 - .500  
And  
Oregon Administrative Rules 340-141  
By the  
Oregon Department of Environmental Quality



State of Oregon  
Department of  
Environmental  
Quality

  
Charles W. Donaldson, Manager Emergency Response

June 12, 2005

June 12, 2010



COOPERATIVE, INC.

200 S.W. Market Street  
Suite 190  
Portland, Oregon 97201  
Phone: 503-220-2040  
Fax: 503-295-3660

[www.cleanriverscooperative.com](http://www.cleanriverscooperative.com)

February 1, 2007

Lian Jewell  
Cascade General  
5555 N. Channel  
Portland, OR 97217

Dear Lian,

Enclosed is documentation of your membership in the Clean Rivers Cooperative (CRC) in the form of a Letter of Intent (LOI) and a Certificate of Membership. Copies of CRC Washington Department of Ecology Primary Response Contractor (PRC) approval and the US Coast Guard Oil Spill Removal Organization (OSRO) classification are also included.

CRC response activities and contractor training summaries for 2006 are submitted for use in compliance with the National Preparedness For Response Exercise Program (NPREP).

Finally, two copies of the current Bylaws as approved by the Board and Membership are included. The exhibits provide a membership list, an equipment list, the participation formula and emergency procedures.

Please sign the Bylaws and return one copy to us in the envelope that has been provided. Do not hesitate to contact me if we can be of service.

Best regards,

A handwritten signature in black ink that reads "Tim Archer".

Tim Archer  
General Manager

Enclosure (7)





200 S.W. Market Street  
Suite 190  
Portland, Oregon 97201  
Phone: 503-220-2040  
Fax: 503-295-3660

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February 1st, 2007

Lian Jewell  
Cascade General  
5555 N. Channel  
Portland, OR 97217

**Letter of Intent to Respond to an Oil Spill Incident**

Dear Lian,

This letter is to acknowledge that Cascade General is a member of Clean Rivers Cooperative, Inc. and that the Cooperative will provide Cascade General with oil containment and recovery services according to the terms and conditions outlined in the Membership Bylaws, as mutually agreed upon by Cascade General and the Cooperative.

As stated in Article 8.1, The Cooperative shall maintain a statement of emergency procedures to be followed in the event of an oil spill emergency in the Area of Interest involving any Member, for which a Member is or may be legally or contractually responsible, or to which the Cooperative is otherwise contractually obligated to respond.

Best Regards,

A handwritten signature in black ink that reads "Tim Archer".

Tim Archer  
General Manager

# *Certificate of Membership*

**CLEAN RIVERS**  
COOPERATIVE, INC.

Issued to:

**Cascade General**

5555 N. Channel, Portland, OR 97217

This is to certify that the above named company is a member in good standing of Clean Rivers Cooperative, Inc. and is therefore entitled to all the rights and privileges thereof.

1-22-07

Date

Tim Archer

Tim Archer, General Manager  
Clean Rivers Cooperative, Inc.  
Portland, Oregon

## **1.0 FACILITY INFORMATION**

### ***1.1 Facility Specific Address***

Facility Name:	Cascade General, Inc.
Street Address:	Portland Ship Yard
	5555 North Channel Avenue
City:	Portland
County:	Multnomah
State:	Oregon
Zip Code:	97217
Telephone number:	(503) 285-1111
Facsimile:	(503) 247-6050

### ***1.2 Facility Location - River***

Willamette River	Mile 8.3
Latitude:	45 Degrees 34'00"
Longitude	122 Degrees 43'00"

### ***Facility Location - Land***

Swan Island	Northwest end
US I-5 exit 302C	US I-5 to Swan Island exit, follow signs to Swan Island, to Portland Ship Yard, on Channel Avenue

### ***1.3 Facility Information***

Operator:	Cascade General, Inc.
Address:	5555 North Channel Avenue Portland, Oregon 97217
Owner:	Vigor Industrial, LLC
Address:	5555 North Channel Avenue Portland, Oregon 97217

#### ***1.3.1 Start Date of Operation***

Cascade General, Inc.	January 1, 1996
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#### ***1.3.2 24 Hour Notification Contact***

Security (Main Gate)	(503) 247-1799
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#### ***1.3.3 Type of Facility***

Cascade General, Inc., is a multi-use facility for ship repair and maintenance, fabrication of metal structures, sand blasting and painting, overhauling marine and non-marine equipment, and oil and wastewater storage and treatment.

#### *1.3.4 Oil Handling Information – Type and Storage*

Marine and Off-Site Facility Generated:	<ul style="list-style-type: none"><li>• Vessel tank slops</li><li>• Bilge oily water</li><li>• Industrial oily waste water</li></ul>
Volume of Oil Stored:	27,500 barrels daily
Maximum Volume of Oil Storage:	150,000 barrels
Facility Generated – Bulk:	<ul style="list-style-type: none"><li>• Diesel</li><li>• Gasoline (unleaded)</li><li>• Heating oil</li></ul>
Type of Storage:	Underground storage tanks
Volume of Oil Stored:	<ul style="list-style-type: none"><li>• Diesel: 143 barrels</li><li>• Gasoline: 143 barrels</li><li>• Heating Oil: 476 barrels in each of 2 tanks</li></ul>
Maximum Volume of Oil Storage:	1,238 barrels
Facility Generated – Small Container:	<ul style="list-style-type: none"><li>• Lubrication</li><li>• Waste oil/sludge</li><li>• Oil refuse</li></ul>
Type of Storage:	Covered sheds, gated, locked
Volume of Oil Stored:	~30 - 55 gallon drums: 39 barrels
Maximum Volume of Oil Storage:	~60 - 55 gallon drums: 78 barrels

## ***1.4 Table of Contents***

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### 1.5 DEQ Cross Reference Index

#### Section and Description

#### Plan Format Requirements (OAR 340-141-130)

DEQ Cross Reference	Section 1.5
Simplified Field Document	Section 2.0

#### Plan Content Requirements (OAR 340-141-140)

1	Submittal Agreement	
	(a)	Section 1.1
	(b)	Section 6.1
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2	Amendments	Section 1.6
3	Table of Contents	Section 1.4
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	(a)	Section 2.0
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5	Updates	Section 1.7
6	Implementation Strategy	Section 2.3
7	Spill Response System	Section 2.3
8	Contractors	Section 6.2/6.3
9	Relationship to Other Plans	Section 2.3
10	Spill Detection	Section 2.2.2/6.1/7.2
11	Notifications	Section 2.1
12	Response Personnel	
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13	Equipment	
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15	Response Operation Sites	Section 2.0
16	Response Flow Chart	Section 2.2/6.1
17	Authorities	Section 2.2/2.3
18	Damage Control	Section 2.2/2.3
19	Containment	Section 2.2/2.3
20	Response Time	Section 2.1/2.3
21	Chemical Agents	Not applicable
22	In Situ Burning	Not applicable

23	Environmental Protection	Section 2.4
24	Interim Storage	Section 6.3
25	Health and Safety	Section 6.5
26	Post Spill Review	Section 5.0
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30	Logistical Resources	Section 2.2.3A1/3.0/6.3
31	Scenarios	Section 4.0
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2	Emergency Response Action Plan	Section 2.0
	(i) Notification Procedures	Section 2.1
	(ii) Facility's Spill Mitigation Procedures	Section 2.2
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3	Hazard Evaluation	Section 3.0
4	Spill Scenarios	Section 4.0
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## 1.6 Record of Changes

[illegible]

#### *1.6.1 Amendments*

Amendments or revisions to this plan shall be maintained through the means of a log sheet, an example of which precedes this page, and shall be placed in the front of the plan.

The log sheet provides for a record of amendments as follows:

- Section amended.
- Date section replaced with new amendment.
- Verification that the Department of Environmental Quality, Environmental Protection Agency, and the United States Coast Guard have been notified of the amendment.
- Initials of the person making the change.
- Description of the amendment.
- Purpose of the amendment.

## **1.7 UPDATES AND PLAN REVIEW**

### **1.7.1 Plan Review**

A review of the plan shall be conducted by Cascade General, Inc., annually, and recorded on the amendment log, within one month of the anniversary of the submittal of this plan.

After any significant discharge, the plan shall be reviewed for effectiveness during the post-investigation process.

Revisions or amendments shall be submitted to the USCG Captain of the Port for inclusion into the plan or for approval whenever:

- A change in the facility configuration significantly affects the information included in the plan;
- A change in the type of oil handled, stored, or transported affects the response resources;
- A change in the name(s) and/or capabilities of the oil spill removal organization;
- A change in the facility's emergency response procedures;
- A change in the facility's operating area not covered by the existing plan;
- Any other changes significantly affect the implementation of the plan;
- Any changes in the listings of economically important or environmentally sensitive areas identified in the Area Contingency Plan effect the plan.

### **1.7.2 Plan Distribution**

Revisions shall be submitted to the USCG Captain of the Port, including a cover letter with a list of revisions as well as a copy of the revisions.

At the same time and using the same format, revisions shall be submitted to the Oregon Department of Environmental Quality, and the Environmental Protection Agency, Region X.

Other interested parties may receive this plan and updates as appropriate.

## **2.0 EMERGENCY RESPONSE ACTION PLAN**

### *Purpose*

Cascade General, Inc. a marine transportation- and non-transportation-related facility, has developed this plan to meet the requirements for an oil spill response, in accordance with OAR 340-141 and 33 CFR 154 Subpart F. Its purpose is to:

- Promote the prevention of oil spills;
- Provide a plan consistent with the west coast approach to oil spill prevention and response;
- Maximize the effectiveness and timeliness of oil spill response;
- Support coordination with state, federal, and other contingency plans;
- Provide improved protection of Oregon waters and natural resources from the impacts of oil spill; and
- Utilize the Lower Columbia River Geographic Response Plan for establishing response priorities and action.

### *Scope*

As a fixed marine transportation-related facility with the potential to cause significant harm to the environment, Cascade General, Inc., considers the scope of this plan to encompass:

- The waters adjacent to that end of Swan Island in the Willamette River known as the Portland Ship Yard;
- Downstream to the confluence of the Willamette River with the Columbia River;
- Downstream from the confluence of the Willamette River to the mouth of the Columbia River.

### *Responsibility*

Cascade General, Inc. initiates a response action with its spill response personnel based on prevailing conditions, extent and type of spill, and assets available at the time of the spill. Its area of response is immediately adjacent to the facility within the permanent boom, and within the temporary booms for vessels in its control. When the spill poses a potentially serious threat to waters of the state beyond the capability of the facility to control and manage, outside resources are notified for response.

It is the responsibility of the outside response resource to establish its command post for managing the spill response effort, deploy its personnel and material, and maintain communications with Cascade General, as well as governmental agencies involved in the response.

## **2.1 Notification Procedures**

Notify the US Coast Guard and Oregon Department of Environmental Quality immediately.

- Describe type, quantity, location of spill;
- Describe corrective actions taken, and to be taken;
- Maintain cleanup activities until notice is received from the responding agencies that a satisfactory level of cleanup has been achieved.

Prepare and submit a complete and detailed report to the Department of Environmental Quality, US Coast Guard, Environmental Protection Agency and/or other appropriate agencies, as necessary.

### **2.1.1 Incident Command Spill Response Checklist**

#### **\_\_\_ Safety of Personnel**

- warn all persons in the immediate area

#### **\_\_\_ Secure the Source**

- eliminate ignition sources
- close headers and other valves
- employ damage control equipment as required
- take other actions as needed

#### **\_\_\_ Establish Safety and Security Zone**

- determine the extent of the safety zone; check MSDS
- secure safety zone to all unauthorized personnel
- enforce safety inside the zone
- initiate evacuation of all non-essential personnel
- don Personal Protective Equipment (PPE) as required

#### **\_\_\_ Initial Assessment and Containment**

- assess spill volume and type
- predict spill movement, weather and current conditions
- identify local environmentally sensitive areas
- initiate action to contain or divert as necessary on dock, land, or water with boom and sorbent. Prevent contamination of environmentally sensitive areas

#### **\_\_\_ Assessment and Containment**

- containment boom - amount and type required
- deflection exclusion boom - amount required for shoreline protection
- equipment availability
- boom deployment strategies

#### **\_\_\_ Set Up Command Center or Structure as Required**

\_\_\_ Determine Recovery Equipment Needs

- skimmer needs and availability
- vacuum truck needs and availability
- tanker truck needs and availability
- slop tank needs and availability
- sorbent material needs and availability
- shoreline cleanup methods and equipment
- water cleanup methods and equipment

\_\_\_ Set Up Communications As Needed

\_\_\_ Recovery Operations

- skimmers
- absorbents
- shoreline

\_\_\_ Coordinate Interim and Permanent Disposal

- interim storage area secured and available
- oily water/debris treatment options reviewed
- discharge permits - NPDES or POTW (sewer permit)

\_\_\_ Decontamination

- required
- location
- setup

\_\_\_ Documentation

- actions taken
- agencies notified
- report numbers
- name of persons reported to
- time and location
- additional assistance needed for documentation

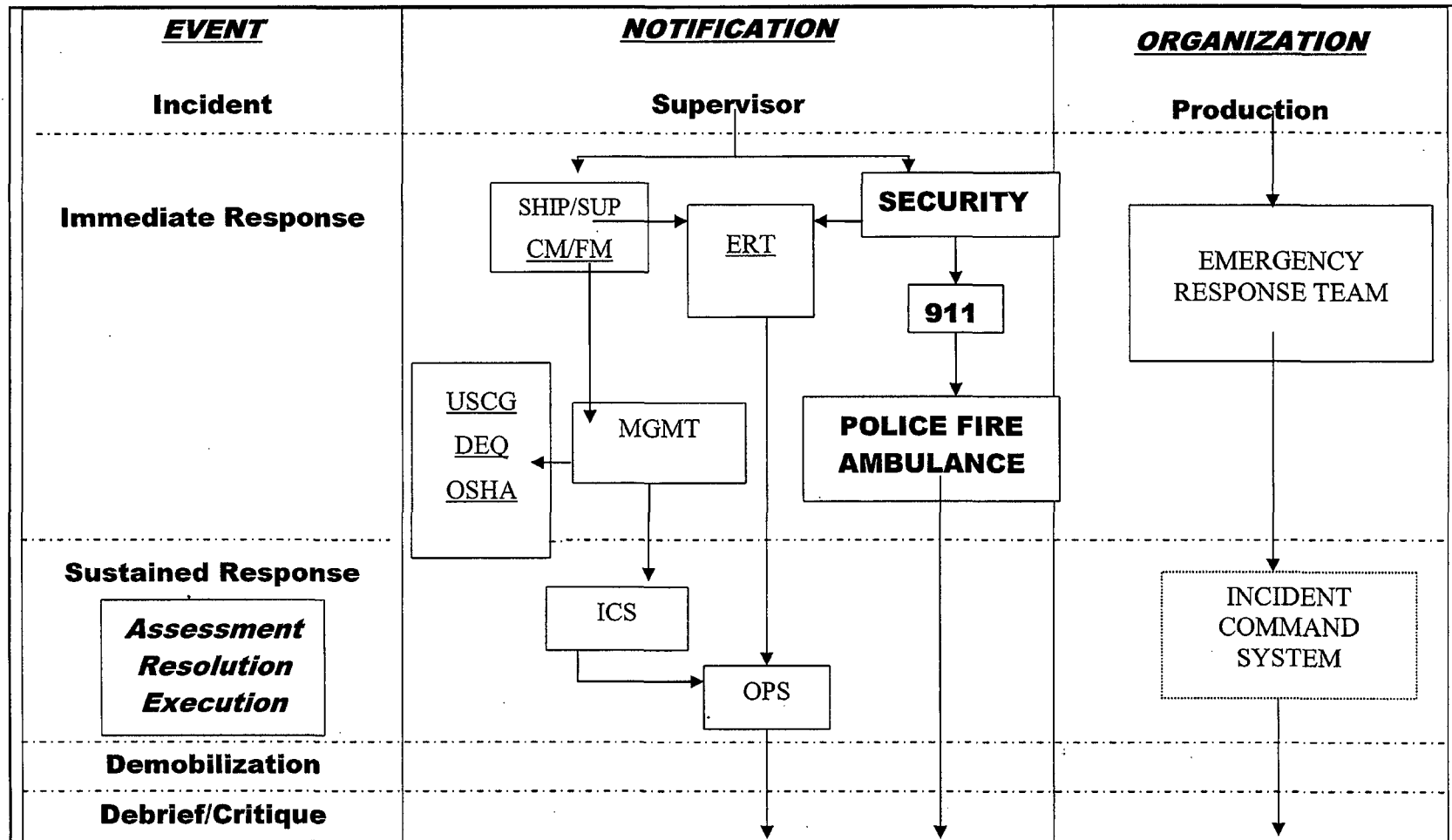
\_\_\_ Debrief/Critique

- Communication
- Response time, equipment, personnel
- Safety and health plan
- Containment and disposal

*2.1.2 Procession of Spill Response Operations Flowchart*

The following incident-command flow chart is designed for use in any response operation conducted by Cascade General, Inc.

## 2.1.2 INCIDENT COMMAND FLOW CHART





### 2.1.3 Notification List

Cascade General	Work-Phone	Home Phone	Alternate Number
<b>Qualified Individual</b> Alan Sprott	(503) 247-1672	[REDACTED]	(503) 703-0875
<b>Incident Commanders</b> Alan Sprott Lian Jewell Acting Ship Superintendent	(503) 247-1672 (503) 247-1806 (503) 247-1394	[REDACTED]	(503) 703-0875 (503) 781-8161 (503) 703-9271 Radio Channel 1
<b>Facility Contacts</b> Ken Swingle Jerry Hunt	(503) 247-1667 (503) 247-1639	[REDACTED]	(503) 702-2292 (503) 705-4428
<b>Safety Director</b> Lindsay Docherty	(503) 247-1761	[REDACTED]	(503) 804-8539
<b>Security</b> Main Gate	(503) 247-1799		9911
<b>Outside Organizations</b>		<b>Phone Number</b>	
<b>Private Cleanup Companies</b> West Coast Marine Cleaning, Inc. Clean Rivers Cooperative		(503) 285-2485 (503) 220-2040	
<b>Local Response Agencies</b> Portland Fire Department Portland Police Department Ambulance Emanuel Hospital		911 911 911 (503) 413-2200	
<b>Government Agencies</b> National Response Center U.S. Coast Guard Harbor Master Oregon Emergency Response Service DEQ Northwest Region Portland Bureau of Environmental Services		(800) 424-8802 (503) 240-9370 (503) 823-3767 (800) 452-0311 (503) 229-5263 (503) 823-7180	

### 2.1.4 Discharge Information\*

Reporting Party		Suspected Responsible Party	
Name Phones  Company Position Address  City State Zip		Name Phones Company Organization Type Private Citizen Public Utility Local government State government Federal Government  City State Zip	
Were materials discharged?		Yes	No
Calling for Responsible party?		Yes	No
Incident Description			
Source and or Cause of Incident			
Date _____ Time _____ Cause			
Incident Address/Location		Nearest City	
Distance from City			
Storage Tank Container Type: Above ground Y/N Below ground Y/N Unknown			
Facility Capacity			
Tank Capacity Latitude Degrees Longitude Degrees Mile Post or River Mile			
Materials			
Discharge Unit of Quantity	Measure	Discharged Material	Quantity in Water
Response Action			
Actions Taken to Correct or Mitigate Incident			
Impact			
Number of Injuries		Number of Fatalities	
Evacuations	Yes      No	Number Evacuated	
Damage	Yes      No	Damage in Dollars	
Additional Information			
Information not recorded elsewhere in this report:			
Caller Notifications			
USCG	EPA	STATE	Other

- It is not necessary to assemble all information before calling the National Response Center.

## 2.2 Facility's Spill Mitigation Procedures

Spill mitigation effectiveness is dependent on an initial response and deployment by Cascade General personnel within five minutes of notification of a spill event. Response time by an outside resource is, by contract, no more than two hours. Regardless of the extent or type of spill, it is assumed that responders will use the Lower Columbia Geographic Response Plan in establishing priorities and action.

### 2.2.1 Volume of Persistent and Non-persistent Oil Spilled in a(n):

2.2. 1-A.	Average Most Probable Discharge (AMP) Small Discharge Scenario 50 bbl discharge	USCG EPA
2. 2.1-B.	Maximum Most Probable Discharge (MMP) Medium Discharge Scenario 1200 bbl discharge	USCG EPA
2.2. 1-C.	<p>Worst Case Discharge (WCD): As a "complex" facility (33 CFR Pary 112.2), Cascade General has both transportation and non-transportation related components. The worst case discharge figure for such facilities is based on the larger of the two components. The transportation related worst case discharge is calculated to be 1,549.8 barrels from a spill from Pipeline #1 (see Figure 2.2.1-D2). The worst case discharge for a non-transportation related facility is based on the volume of the largest above ground storage tank (AST) in an adequate secondary containment from a single manifold. Although the piping system for oil storage Tanks T-2 – T-6 leads to a common manifold, there are isolation valves in place on each tank preventing any multiple tank discharge. Tank T-1 does not store oil; Tanks T-3 through T-6 are used to store ballast water and waste oils with an oil-water mixture consisting of approximately twenty-five percent oil. Tank T-2, however, stores a more concentrated recovered waste oil solution and is approximately 75% oil. The maximum volume of oil for this tank is, then, approximately 18,000 bbl. However, the actual <i>capacity</i> of this storage tank, 24,000 barrels. Since this amount is larger than the 1,549.8 barrels from the transportation related part of the facility, it will be used for WCD spill response planning purposes, as per Title 40 CFR Part 112, Appendix D Part A2.1-2.3, and Appendix E 5.2.</p> <p>The guidelines for determining and evaluating required response resources for facility response plans are taken from Appendix E to 40 CFR Part 112, Attachment E-1:</p>	

Part I:

Step (A)	Calculate worst case discharge in barrels	24,000
Step (B)	Oil Group	2
Step (C)	Operational Area	Inland
Step (D)	Percentages of Oil	
	% Lost to Natural Dissipation	40
	% Recovered Floating Oil	15
	% Oil Onshore	45
Step (E)	On-Water Recovery	3,600
	On-Shore Recovery	10,800
Step (F)	Emulsification Factor	1.8
Step (G)	On-Water Oil Recovery Resource Mobilization Factor	
	Tier 1	.15
	Tier 2	.25
	Tier 3	.40

Part II:	On-Water Recovery Capacity (barrels)	
	Tier 1 (12 hrs)	972
	Tier 2 (36 hrs)	1620
	Tier 3 (60 hrs)	2592

Part III:	Shoreline Cleanup Volume (barrels)	19,440
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Part IV:	Response Capacity by Geographic Area (Amount needed to be contracted, barrels)	
	Tier 1	12,500
	Tier 2	25,000
	Tier 3	50,000

2.2. 1-D. The following figures provide facility information showing the oil storage tanks shutoff valves, pipeline sizes, pumping rates, and shutdown times.

2.2. 1-D1 BWTP Storage Tanks and Sizes

2.2. 1-D2 Pipelines 1 - 5

2.2. 1 -E. Site Plan Diagram (See Figure 2.2. 1 -E 1)

Figure 2.2, 1 -E I shows the Facility Site Plan Diagram which includes the facility's Ballast Water Treatment Plant.

2.2. 1-F. Site Drainage Diagram (See Figure 2.2. 1 -F 1)

Figure 2.2. 1-F I shows the Facility Site Drainage diagram which encompasses the storm water drainage system.

# Notes

T-1, T-3 through T-6 are 24,000 barrel tanks containing approximately 25% oil to 75% water mixture

T-2 contains approximately 80% oil to 20% water mixture

T-7 and T-8 are 15,000 barrel capacity processed water tanks

T-9 is a rain water tank

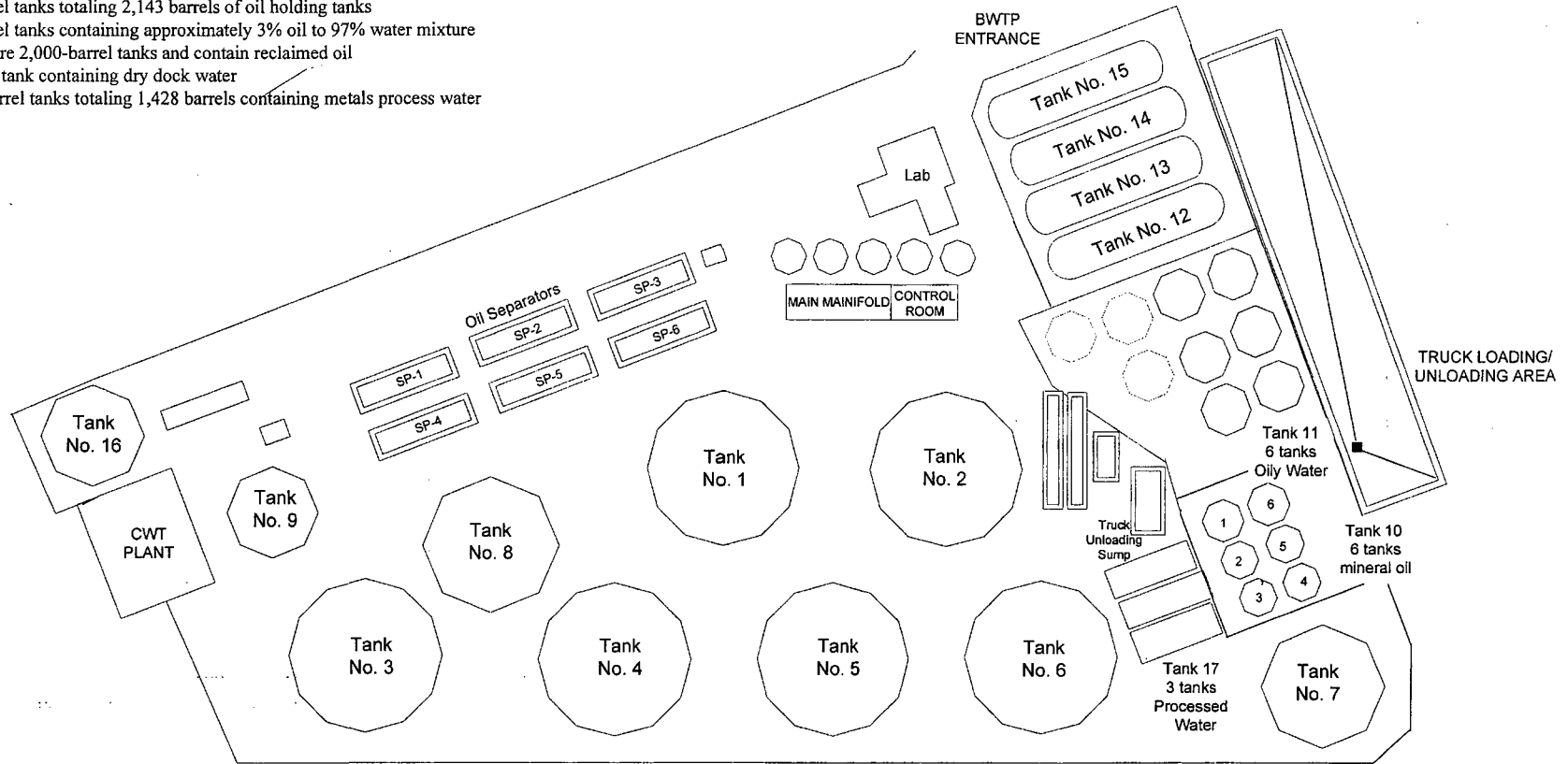
T-10 is six 357-barrel tanks totaling 2,143 barrels of oil holding tanks

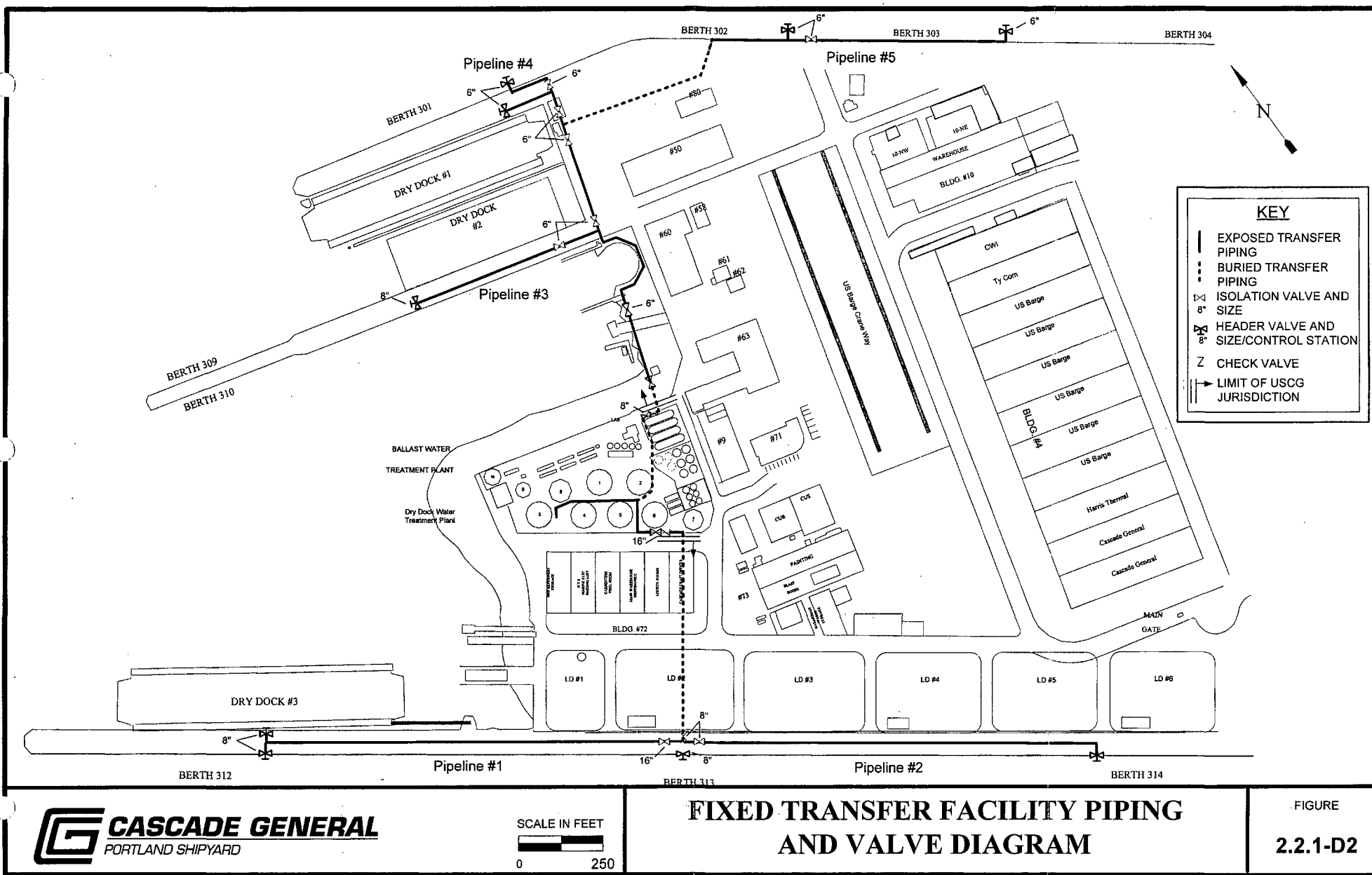
T-11 is six 533-barrel tanks containing approximately 3% oil to 97% water mixture

T-12 through T-15 are 2,000-barrel tanks and contain reclaimed oil

T-16 is 2,380-barrel tank containing dry dock water

T-17 is three 476-barrel tanks totaling 1,428 barrels containing metals process water



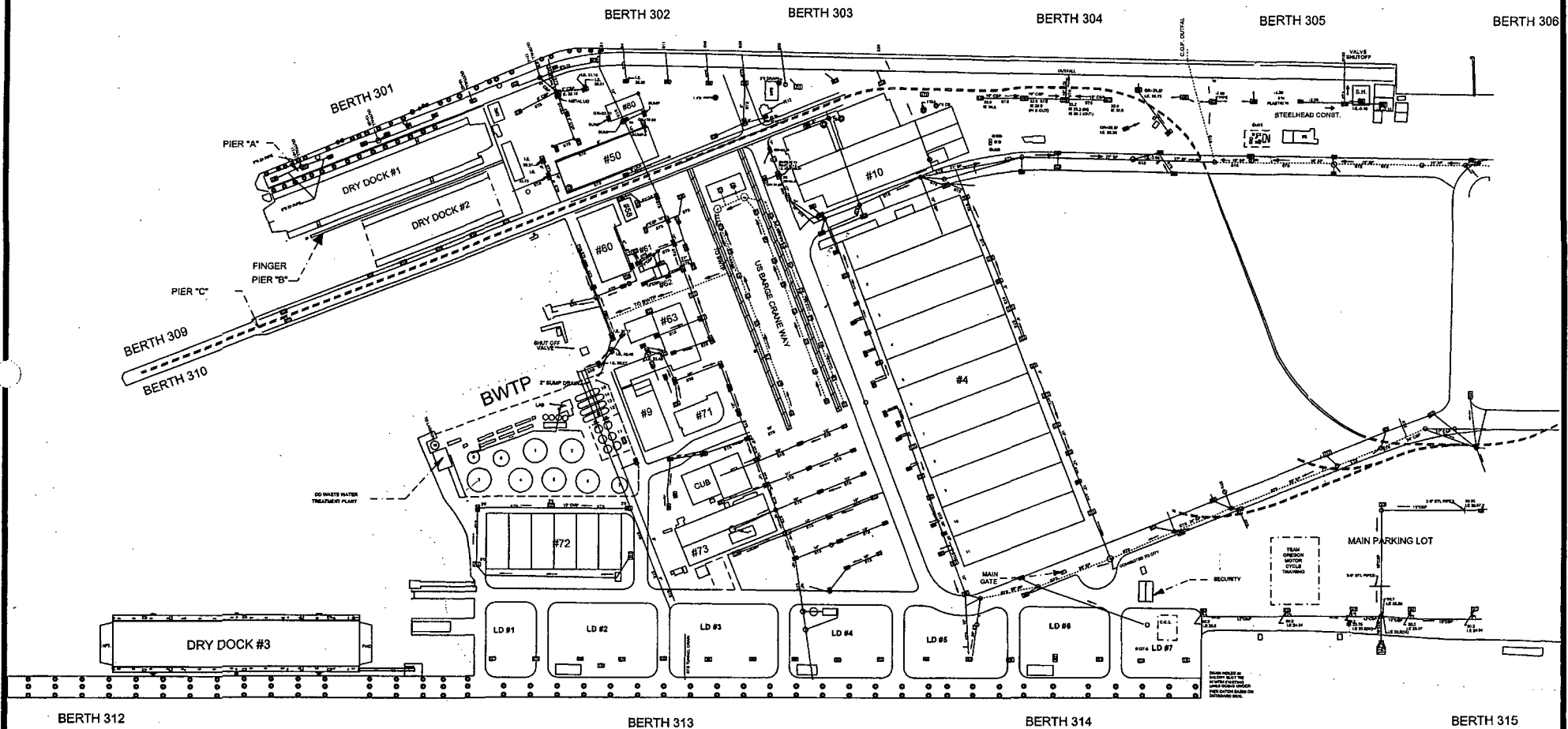




## PORTLAND SHIPYARD SITE PLAN DIAGRAM

### 2.2.1-E

# SWAN ISLAND BASIN





### *2.2.2 Spill Mitigation Procedures - Shut Down*

- Stop product flow. Close valves, stop pumps, etc.
- Warn personnel. Enforce safety and security.
- Shut off ignition sources, open flames, etc.
- Contain if no explosion hazard, deploy boom.
- Assess and classify.
- Begin notification procedures.

Shut down procedures are initiated by on-scene personnel or the Duty Machinist, either as first observer or when notified of a spill by Main Gate Security. The following sections describe the procedures facility personnel follow to shut down operations in the event of a discharge, potential discharge, or emergency involving the following equipment and scenarios:

- Failure of manifold and mechanical loading arm, other transfer equipment, or hoses.
- Tank overfill.
- Tank failure.
- Piping rupture.
- Piping leak.
- Equipment failure.

Failure of manifold and mechanical loading arm, other transfer equipment, or hoses:

All vessel-pumping operations follow USCG guidelines. Assigned and responsible employees are trained and approved "persons in charge". They remain in constant communication with the vessel pump room, the person at the ship side head and person at the shore side head. In case of a failure all above persons can communicate instantly to close down all pumping operations and valves to isolate the manifold.

#### **Tank Overfill**

The six main waste water storage tanks and the two clean salt water storage tanks have both an audible alarm in the Control Tower and a manual gauge on the tank for monitoring. The person in charge is there at all times during a pumping operation to insure that there is no overfill. However, the actions taken to respond to an overfill would be to:

- Depending on the circumstances, open another tank up.
- Shut down pumping.
- Isolate the valves.
- Notify Security.

#### **Tank Failure**

The entire BWTP is bermed for such a situation. The person in charge would minimize the spill by:

- Isolating valves.
- Transferring material from one tank to another.
- Any other defensive measures to contain the spill within the bermed area.
- Notify security.

#### Piping Rupture.

Check valves for the 8-inch line that connects the north side of the yard and the 16-inch line that connects the south side of the yard insure that material pumped into a tank will not feed back into the pipe line if a leak or rupture occurs. The duty mechanic minimizes the spill by:

- Isolating valves.
- Containing the spill.
- Notifying security.

#### Piping Leak (under pressure and not under pressure)

Check valves for the 8" line that connects the north side of the yard and 16" line that connects the south side of the yard help insure that none of the material pumped into a tank will be able to feed back into the pipe line if a leak or rupture occurs. The duty mechanic minimizes the spill by:

- Isolating valves.
- Containing the spill.
- Notifying security.

#### Equipment failure (e.g., pumping system, relief valve, etc.)

If any relief valve failure were to occur, the person in charge will:

- Immediately shut the pumping operations down.
- Close all isolation valves.
- Investigate the problem and make necessary repairs
- Notify the site supervisor.

### 2.2.3 Facility Oil Spill Response Equipment and Inspection Log

DATE OF LAST INSPECTION: MARCH 2007

EQUIPMENT	LOCATION	PURPOSE AND COMMENTS	DATE INSPECTED	INSPECTED BY
7,600 Feet of Permanent Boom	Pre-deployed Surrounding Ship yard	Keeping land side spills within the facility and/or outside spills outside		
2,400 Feet of Permanent Boom	Pre-deployed around Ballast Water Treatment Plant	Predeployment		
1,200 Feet of Deployable boom	Boat Basin	Response Deployment		
1,600 Feet of Deployable Boom, Trailer and Anchoring Systems	Storage Shed across from Berth 305	Response Deployment and Cooperative Use		
1,600 Feet of Deployable Boom, Trailer and Anchoring Systems	Storage Shed across from Berth 305	Response Deployment and Cooperative Use		
21 ft. Alumaweld Spill Response Boat/Twin 90 HP Motor	Boat Basin	Main Response Boat		
14 ft. Long Bronc/45 HP Motor	Boat Basin	Back up Response Boat and Dry-dock Use		
14 ft. Steel Skiff / 25 HP Motor	Boat Basin	Back up Response Boat and General Work Boat		
Ten Slop Tanks	Throughout Yard	Provide containment for any collected oil		
Floating Platform	Boat Basin	To Transport oil in Portable tanks from spill to shore.		
Two (2) 18,000 Gal. Portable Baker Tanks	Berth 314	Containment for any skimmed oil		
Four (4) diaphragm pumps	(2) Boat basin staging area (#1) (2) Ballast Water Treatment Plant	Transfer oil from tank to tank and to use on the skimmer		

EQUIPMENT	LOCATION	PURPOSE AND COMMENTS	DATE INSPECTED	INSPECTED BY
Oil recovery equipment shed	Carpenters Shop	For small spill clean-up [See attached equipment list]		
DeCon Unit	Boat Basin Staging Area	Decontamination for employees		
Four (4) VHF Radios	(1) Spill response boat and (3) hand helds / bldg. 71	Communications / Compatible with Co-op		
Forty (40) UHF Radios	General Yard Use	In house communication		
Cellular phones (5)	Issued to each incident commander	Incident commander communications		
Personal Protective Equipment (PPE)	Boat Basin Staging Area	Spill cleanup [See attached equipment list]		
Clean up Equipment	Boat Basin Staging Area	Spill cleanup [See attached equipment list]		
Twelve (12) Gantry Cranes with Boom Lights	Throughout Shipyard	Lighting		
Generators	Throughout Shipyard	Power supplies [See attached equipment list]		

### **2.3 Facility's Response Activities**

Key elements in spill control are:

- Rapid detection
- Securing the source of the spill, and
- Notification.

Securing the sources includes:

- stopping pumps,
- closing valves, plugging leaks,
- warning personnel of potential dangers,
- securing ignition sources,
- evacuation if necessary and then,
- containment of the spill.

#### **2.3.1 Facility Personnel Responsibilities**

Spill Response Coordinator (SRC) – Following notification of the Spill Response Team

- Reports immediately to the scene of the incident and assumes responsibilities for the clean up operation.
- Authorizes the activation of cleanup operations, resources, hiring contractors, purchases, etc.
- Coordinates the activities of the Spill Response Team.

Spill Cleanup Manager (SCM)

- Directs off-shore and on-shore cleanup activities.
- Supervises planning and support functions directly related to field operations.
- Provides 24-hour supervision of cleanup as necessary.
- Provides relief for the Spill Response Coordinator as required.

Spill Response Team (SRT)

- On call 24 hours a day, 7 days a week.
- Maintains readiness and availability.
- Figure 2.3.1 depicts SRT organization.

#### **2.3.2 Qualified Individual's Responsibilities and Authority**

- Arrives in a reasonable time.
- Speaks English.
- Is available on a 24-hour basis.
- Has unconditional authority to implement the Oil Spill Contingency Plan.
- Activates and contracts with necessary response personnel.
- Acts as liaison with Federal On-Scene Coordinator.
- Obligates, either directly or through prearranged contracts, any funds required to carry out all necessary or directed oil response activities.

### *2.3.3 Organizational Structure*

Response actions will be managed under an Incident Command System (ICS). The ICS is organized to mitigate an emergency spill incident. The greater the scope of the emergency, the greater the number of persons needed to participate in the spill response action. Key positions are described below. Figure 2.3.3 illustrates the organizational structure.

#### Incident Commander

The Incident Commander (IC) is the general manager of the spill response. This position is responsible for coordinating and directing all phases of a spill response as the on-scene representative of the Incident Command Agency (ICA). The lead ICA will depend of the incident specific parameters.

#### Public Affairs Representative

The public Affairs Representative advises the SRC on all public considerations pertaining to the spill. This position prepares press releases, and coordinates with media representatives, conservation groups, civic organizations, and the public.

#### Industrial Hygienist

The Industrial Hygienists (IH) reviews the Oil Spill Contingency Plan and response actions to assess the adequacy of measures being implemented to protect worker health and safety. The IH provides recommendations for personal protective equipment (PPE), develops and oversees the response hazard communication program, and ensures the appropriate level of personnel training is performed.

#### Administration Coordinator

The Administration Coordinator (AC) directs and coordinates the activities of the cleanup, in addition to providing relief for the SRC and SCM. This position supports implementation of the response plan, coordinates crew activities, and maintains a petty cash fund.

#### Telecommunications/Logistics Specialist

The Telecommunications/Logistics Specialist keeps track of the location and status of cleanup crews, equipment, materials and progress, and coordinates the telecommunications systems.

#### Insurance Auditor, Purchasing Specialist and Accounting Specialist

The Insurance Auditor, Purchasing Specialist, and Accounting Specialist coordinate respective activities in procurement and cost commitments. The positions monitor contractor activities, issue purchase orders, establish accounting procedures, and track expenditures.

### *2.4 Sensitive Areas*

#### *2.4.1 Areas of economic importance and environmental sensitivity that could be affected:*

The area of coverage for this plan is the Willamette River corridor from the Fremont Bridge northward to the confluence of the Willamette and Columbia Rivers, and the Columbia River corridor from Portland/Vancouver to the mouth of the Columbia River at the Pacific Ocean. The width of the Columbia River varies from one-half mile to six miles wide. The Willamette River is fairly uniform at a quarter of a mile in width.

The Willamette River is an important commercial highway for a variety of barge, tanker, and cargo ship traffic. In the event of a substantial spill, it is likely that vessels would be prevented from traversing the contaminated watercourse. Oil spilled in the Willamette River or upriver on the Columbia River from the junction between the Willamette and Columbia Rivers will flow down the Multnomah Channel. At the junction of the Willamette River and Multnomah Channel, the converging currents create a slack water that tends to disperse oil to both sides of the Willamette River. Areas that may be affected by this during an oil spill are Kelley Point Park, Columbia Slough, and numerous marina and houseboat moorages and log rafts along the Multnomah Channel.

The shorelines along the Columbia and Willamette Rivers covered in this Plan encompass a variety of natural, public, and economic resources. Section 4.2 of the Lower Columbia River Geographic Response Plan (GRP), included in this document (Section 2.4.4), summarizes the high priority resource areas and associated pre-staged oil boom for response along the Lower Columbia and Willamette Rivers to the Pacific Ocean. Response strategies for each of these areas are indicated in Section 4.3.2.1 of the GRP located. Areas of immediate concern for a spill from Cascade General Shipyard are prioritized in GRP Section 4.2.2 Map #9 followed by GRP Section 4.2.1 Map # 9.

Although each of the resources identified in the GRP has been prioritized for protection from oil spills, it should be understood that conditions *at the time of the incident* will dictate the actual response priorities and actions. Decisions on priorities and protection strategies will be based on information contained in the GRP, actual conditions, available resources, and agreement among the participants in the incident command structure.

#### *2.4.2 Boom Staging and Deployment*

Ten thousand feet of skirted boom is permanently deployed around the perimeter of the facility. Containment boom is deployed around all vessels moored at wet berths, and around all working dry docks.

One thousand twelve hundred feet of response boom is staged for deployment at the small boat mooring basin. An additional 3,200 feet of boom and associated towing and anchoring systems, are located in two trailers stored across from Berth 305. This boom will be deployed by the Cascade General Response Team and/or spill response contractor to contain releases that already have escaped, or have the potential to escape, the pre-deployed boom. The boom will be deployed using the Cascade General boat and/or contractor assist boats.

Clean Rivers Cooperative has 14,800 feet of boom pre-staged in Astoria, 2,000 feet in Cathlamet, 6,300 feet in Clatskanie, 12,300 feet in Longview, 12,800 feet in Portland, 1,000 feet in Rainier, 400 feet in Scapoose, 2,900 feet in Skamakawa, 4,100 feet in St. Helens and 3,300 feet in Wauna for a total of 59,500 feet of boom pre-staged along the Lower Columbia River to utilize for protective booming of environmentally sensitive areas (see Section 6.3 CRC Equipment Lists and Records).

#### *2.4.3 Boom Deployment Strategy*

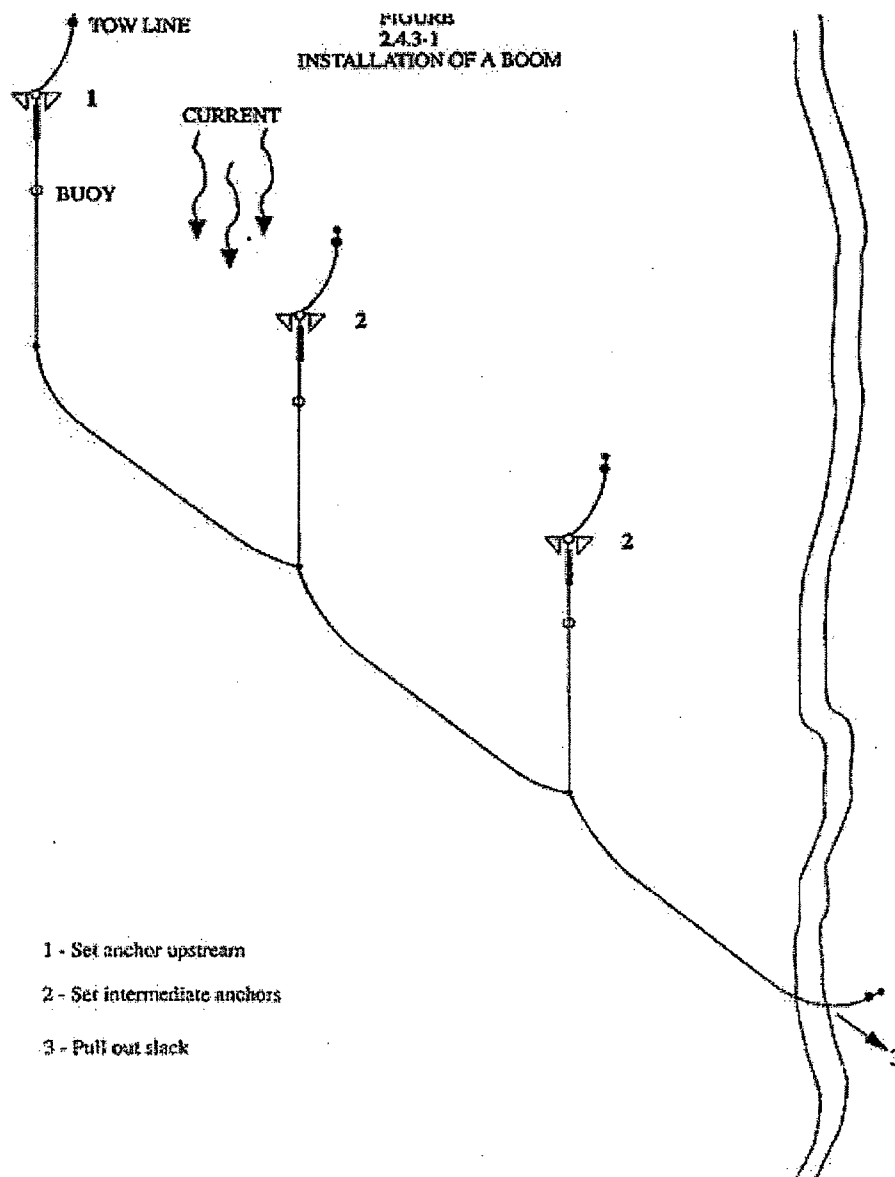
Boom deployment beyond Cascade General's facility utilizes strategies developed for containment and protection of resources. Diagrams 2.4.3 – 1 through 2.4.3 – 11 illustrate appropriate deployment techniques for different situations.

Booming priority and sensitive area maps for sites which could be affected by a spill from Cascade General shipyard, Willamette River Miles 7.5-0.0, Multnomah Channel sites 1-3b and Columbia River Miles 100.8 to 0.0, follow in the relevant sections of the Lower Columbia River Geographic Response Plan.

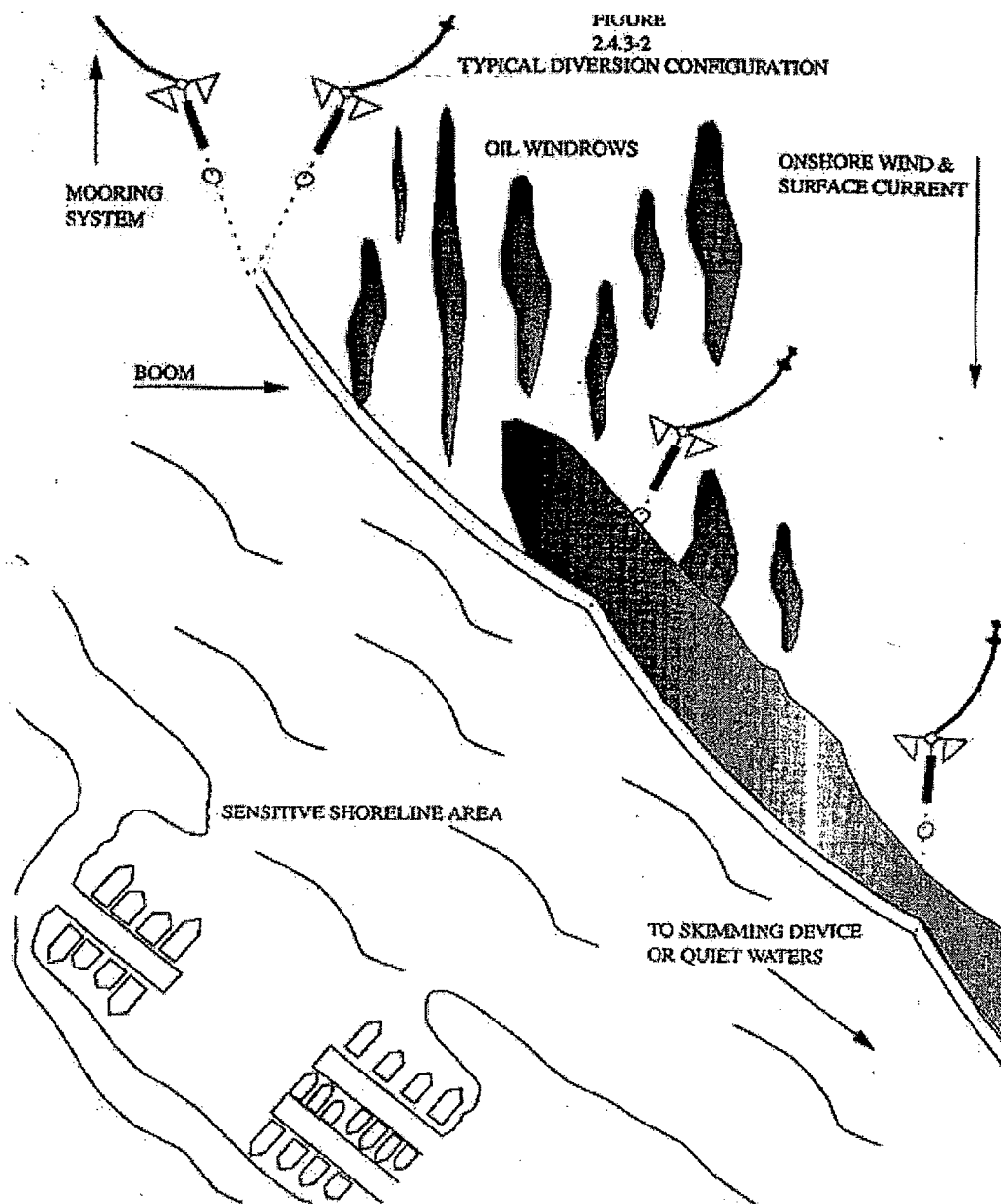
Remediation efforts appropriate to the type of spill and the type of shoreline are also included in the GRP, Section 5.3.



FIGURE  
24.3-1  
INSTALLATION OF A BOOM



- 1 - Set anchor upstream
- 2 - Set intermediate anchors
- 3 - Pull out slack



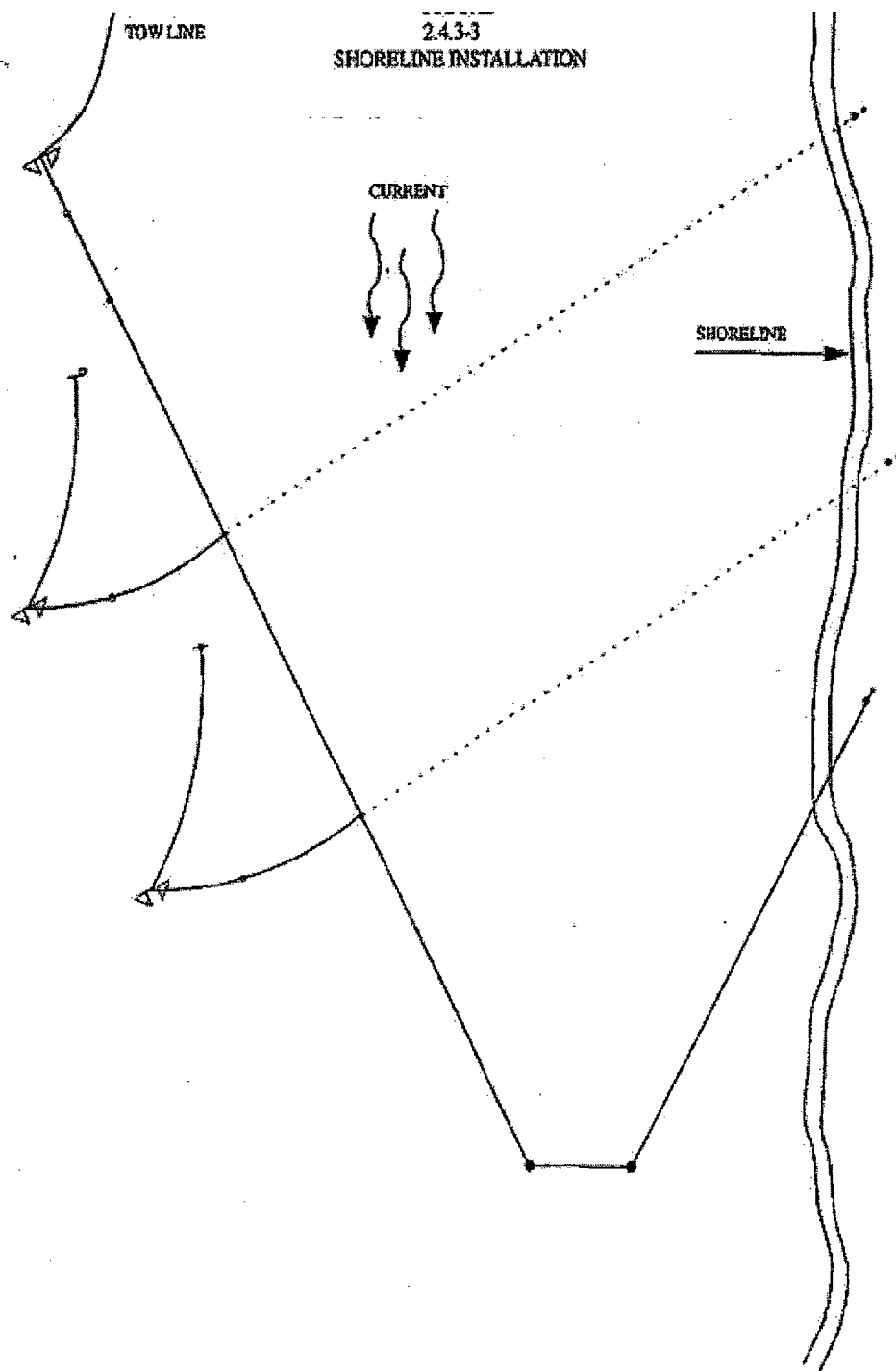
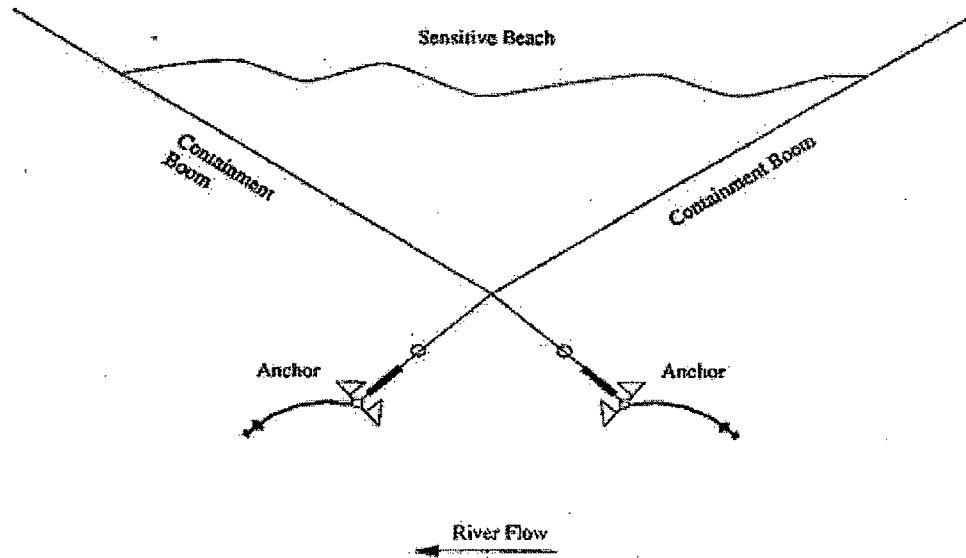
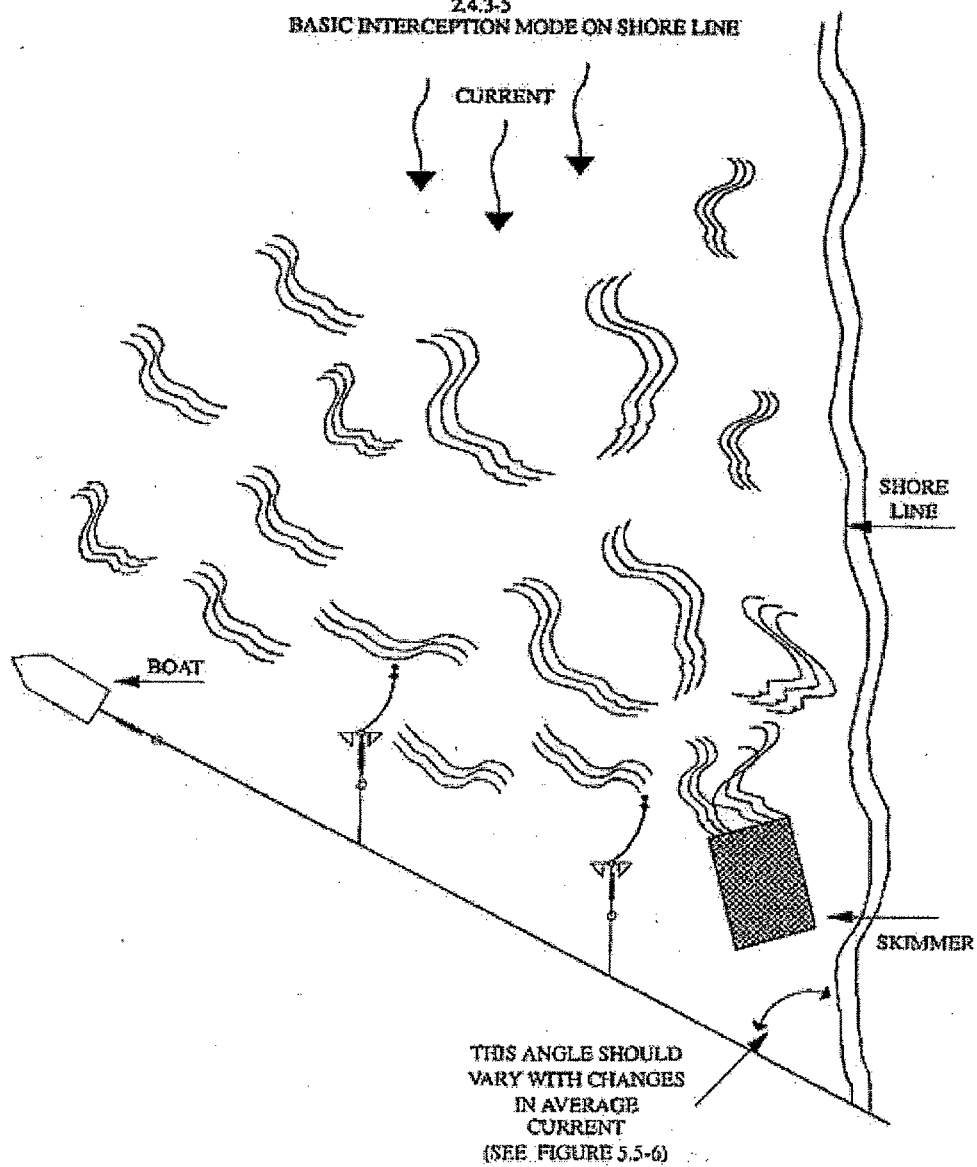


FIGURE  
2.4.3-4  
PROTECTING SHORELINE USING BOOM



2.4.3-5  
BASIC INTERCEPTION MODE ON SHORE LINE



Angle between boom and shoreline (direction of

$$\sin A = V(\text{critical}) / V(\text{current})$$

$V(\text{critical}) = 0.7$  knots

$V(\text{current}) = \text{current velocity in knots}$

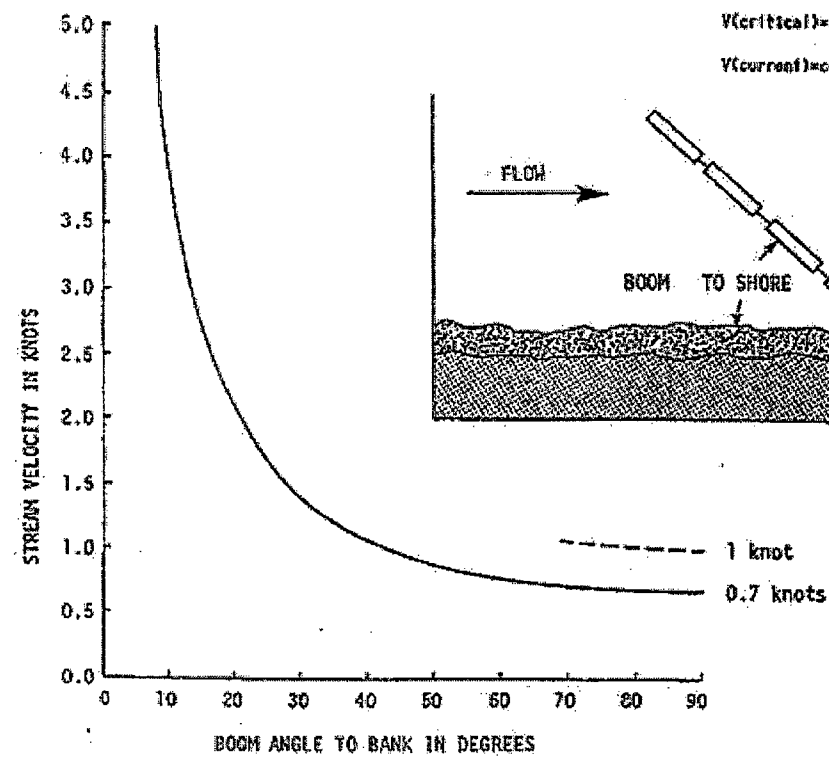
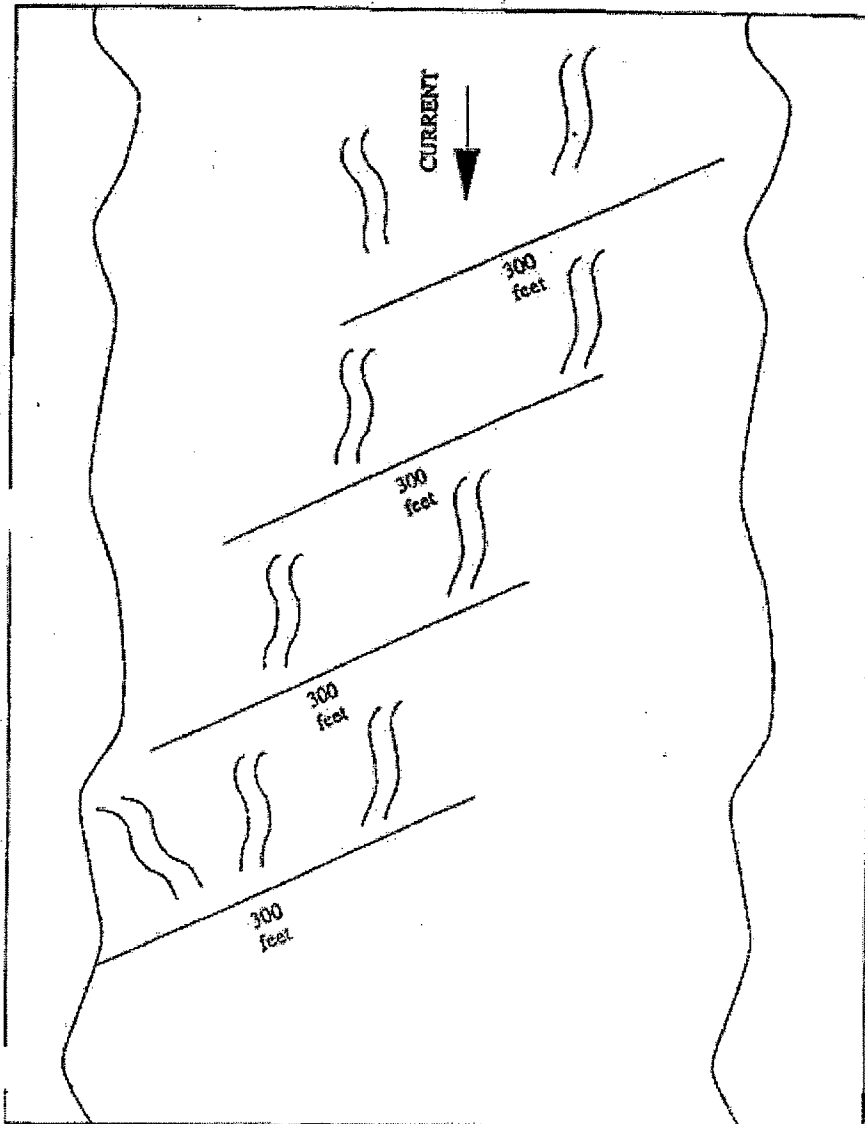
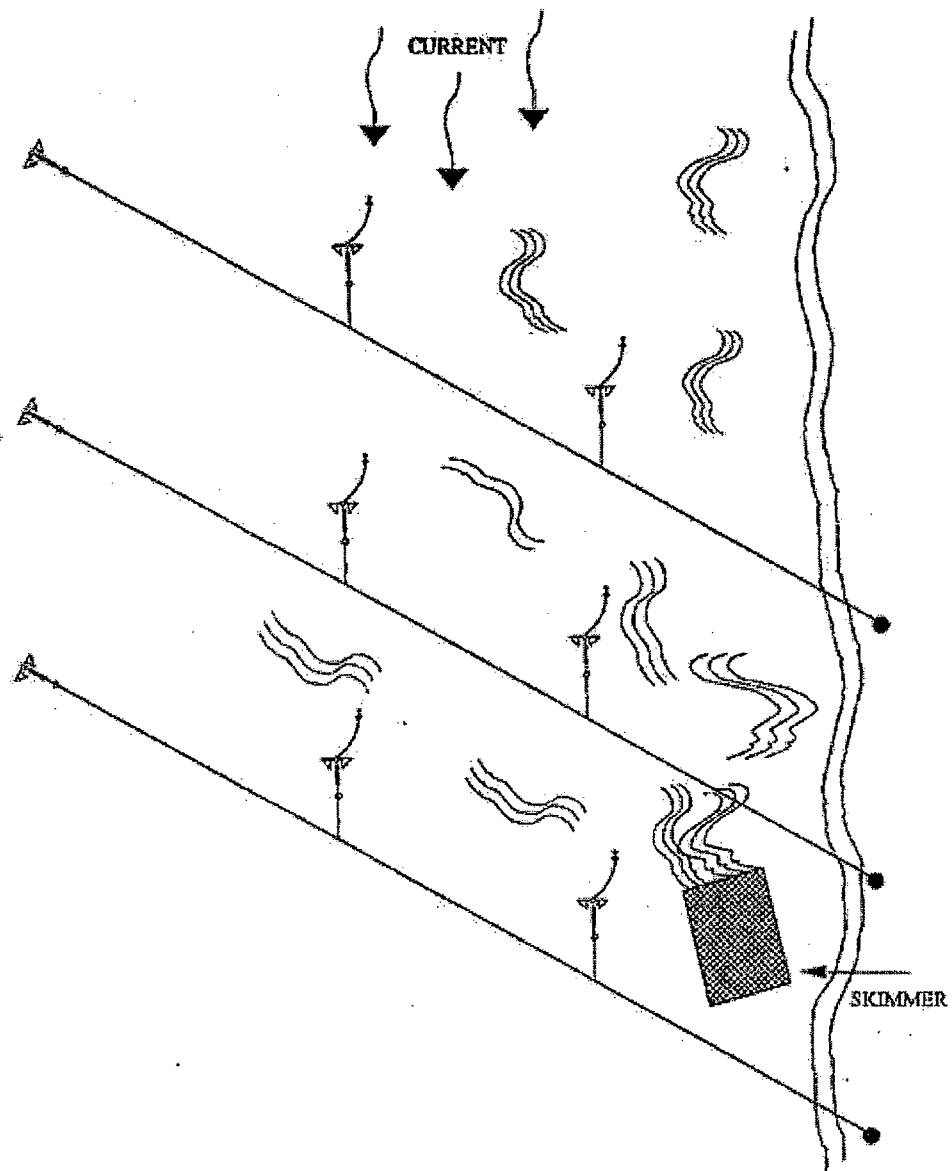


FIGURE 2.9.3-1

Cascade or Step Down Boom System  
(to deflect oil to one side of river for removal)



2.4.3-8  
CASCADE MODE FOR STRONG CURRENTS





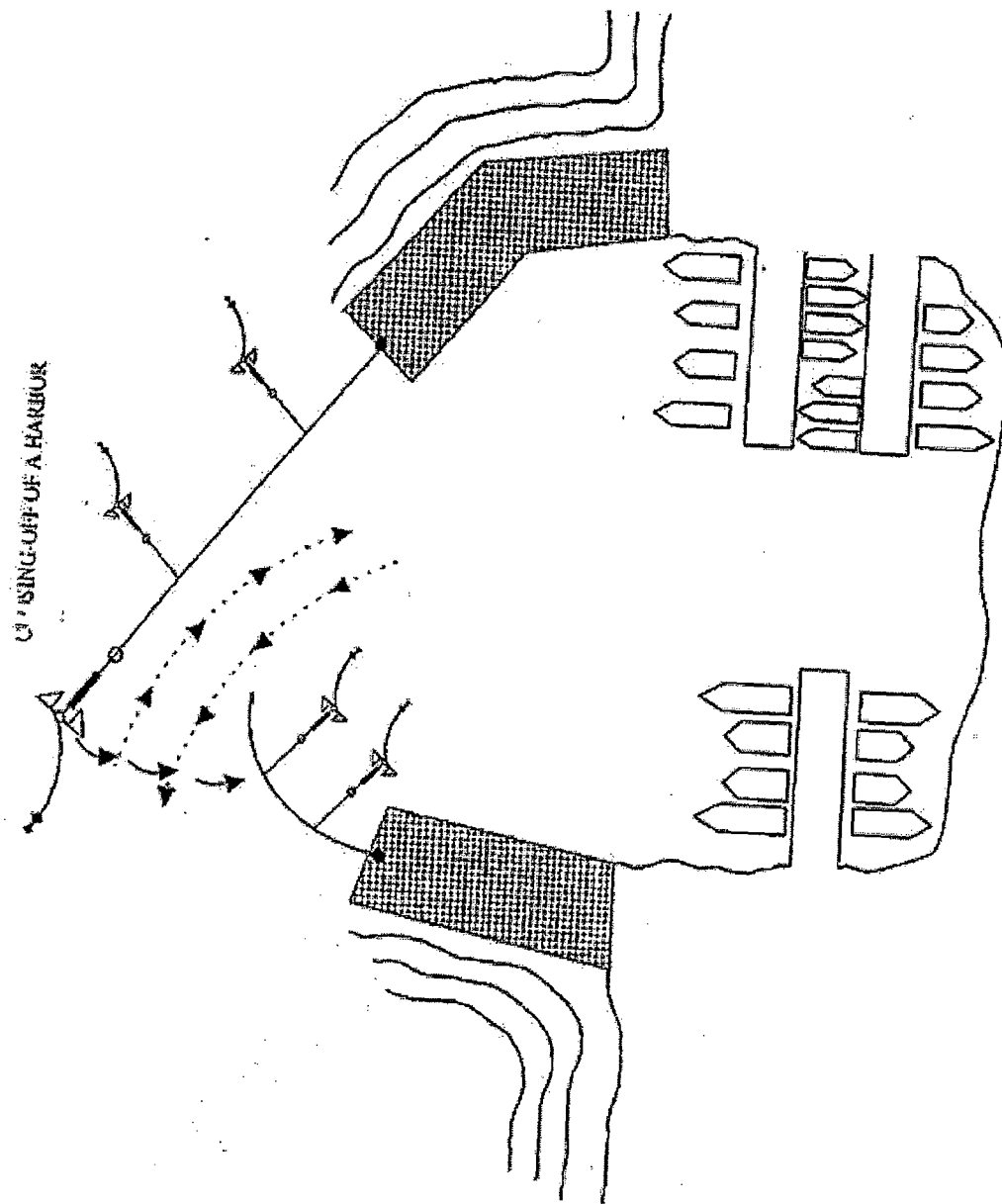
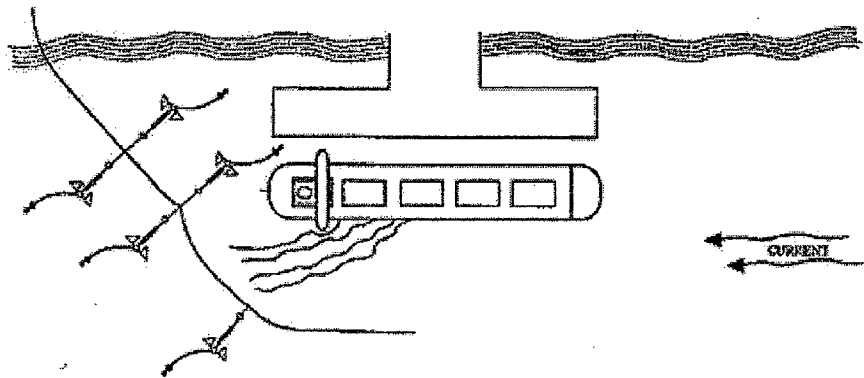
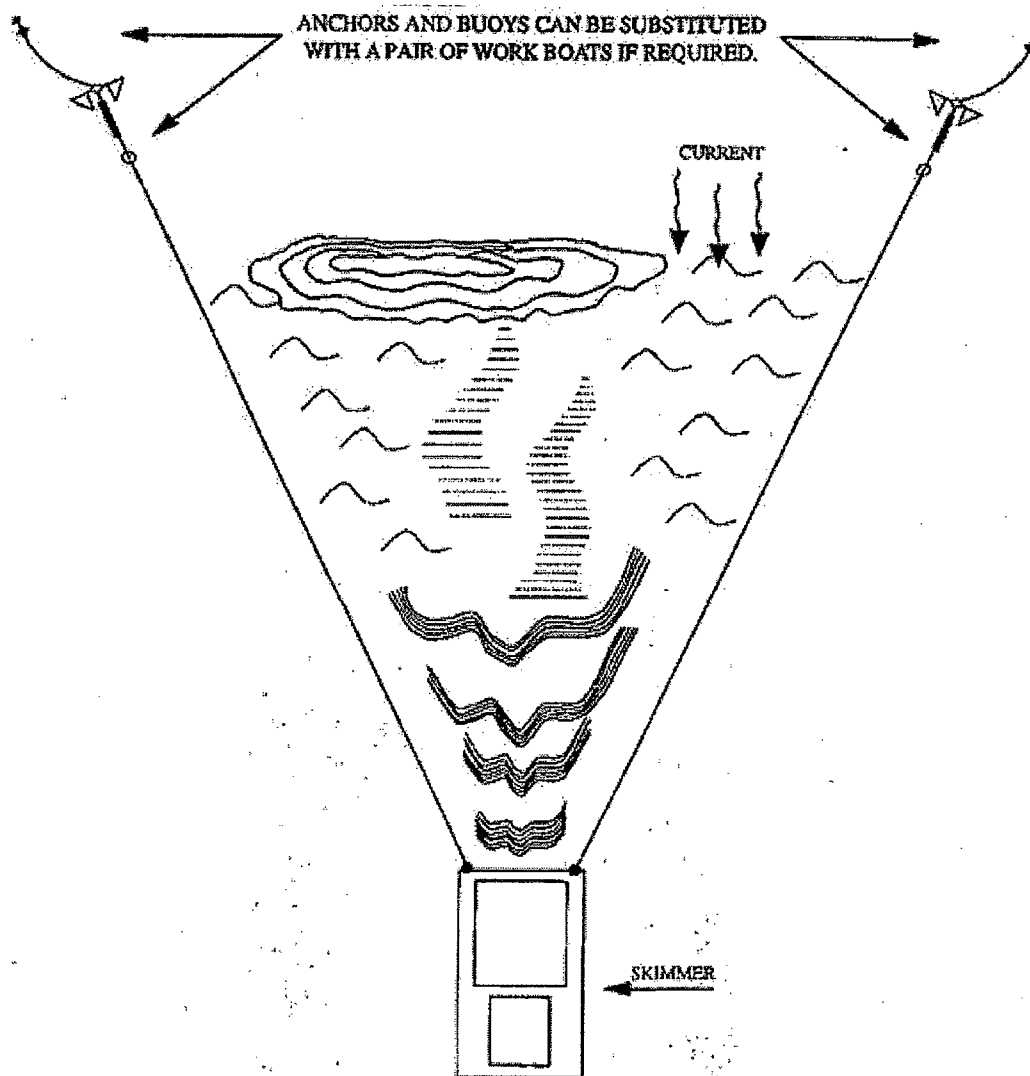


FIGURE  
2.4.3-10  
BOOMING A VESSEL AT DOCK



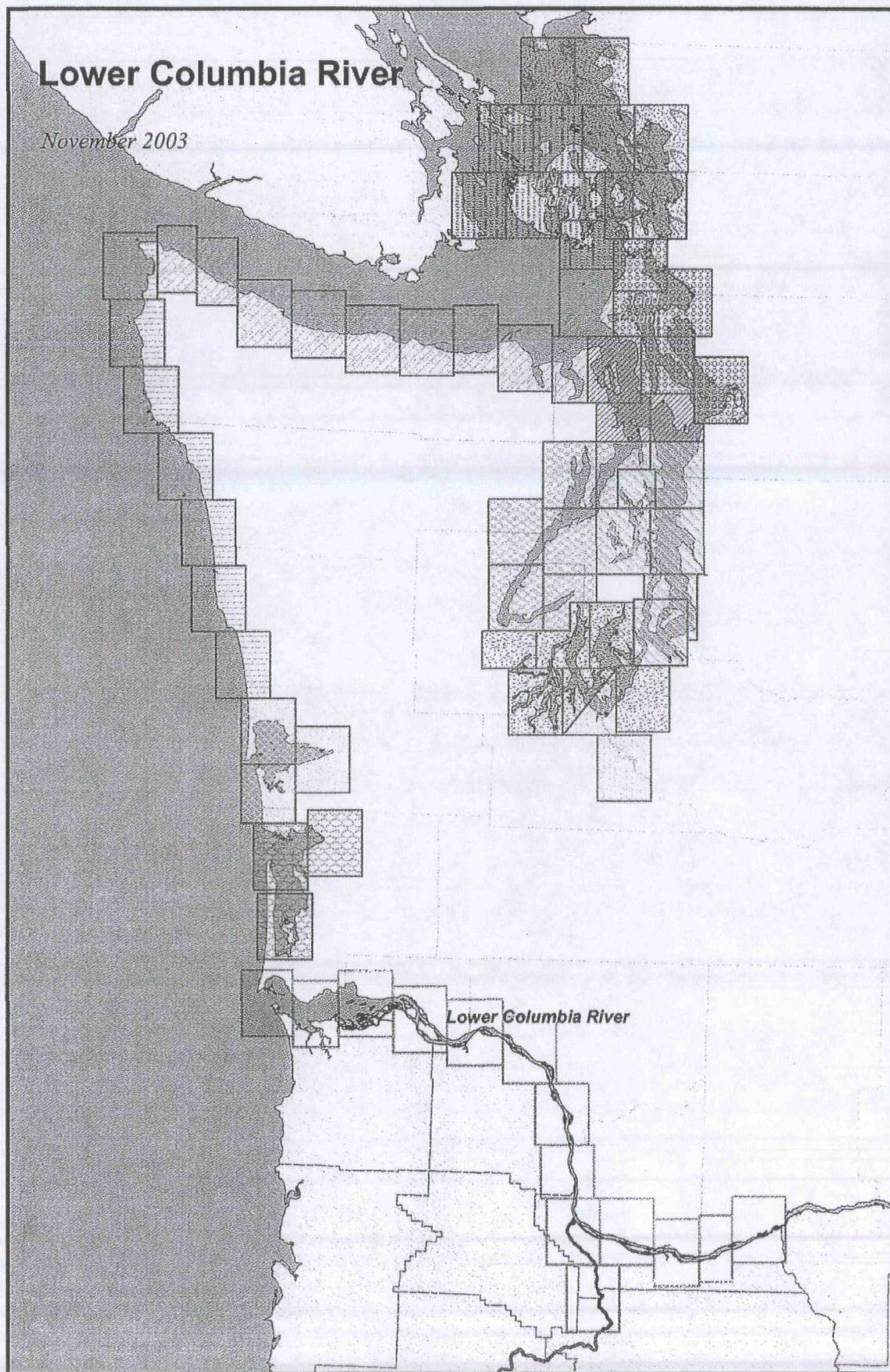
#### *2.4.4 Relevant Sections of the Lower Columbia River Geographic Response Plan*

FIGURE  
2.4.3-11  
FUNNEL EFFECT



# Lower Columbia River

November 2003



**SPILL RESPONSE CONTACT SHEET****Required Notifications For Hazardous Substance or Oil Spills**

National Response Center .....(800) 424-8802

**In Oregon:**

Oregon Emergency Response System .....(800) 452-0311

In State.....(800) OILS-911

**In Washington:**

Emergency Management Division.....(800) 258-5990

Department of Ecology Southwest Regional Office.....(360) 407-6300

Department of Ecology Central Regional Office .....(509) 575-2490

**U.S. Coast Guard**

National Response Center (800) 424-8802

Marine Safety Office Puget Sound:

Watchstander (206) 217-6232

Safety Office (206) 217-6232

Marine Safety Office Portland:

Watchstander (503) 240-9301

Safety Office (503) 240-9379

Pacific Strike Team (415) 883-3311

District 13:

MEP/drat (206) 220-7210

Command Center (206) 220-7001

Public Affairs (206) 220-7237

Vessel Traffic Service (VTS) (206) 217-6050

**Environmental Protection Agency (EPA)**

Region 10 Spill Response (206) 553-1263

Washington Ops Office (360) 753-9437

Oregon Ops Office (503) 326-3250

Idaho Ops Office (208) 334-1450

RCRA/ CERCLA Hotline (800) 424-9346

Public Affairs (206) 553-1203

**National Oceanic Atmosphere Administration**

Scientific Support Coordination (206) 526-4911

Weather (206) 526-6087

**Department of Interior**

Environmental Affairs (503) 231-6157

(503) 621-3682

**Columbia River Inter-Tribal Fish Commission**

Portland Office (503) 238-0667

**Cowlitz Tribe**

Tribal Office (360) 577-8140

**Chinook Tribe**

Tribal Office (360) 777-8303

**Federal O.S.R.O./****State Approved Response Contractors**

All Out Environmental Services (360) 414-8655

Cowlitz Clean Sweep, Inc. (360) 423-6316

FOSS Environmental (503) 283-1150

Fred Devine (503) 283-5285

Global Diving and Salvage (206) 623-0621

MSRC (800) 259-6772

National Response Corporation (800) 899-4672

Tidewater Environmental (503) 289-4274

**Washington State**

Department of Ecology Headquarters (360) 407-6900

Southwest Region (360) 407-6300

Northwest Region (425) 649-7000

Central Region (509) 575-2490

Eastern Region (509) 456-2926

Department of Fish and Wildlife (360) 534-8233

Emergency Management Division (360) 438-8639

(800) 258-5990

**State Patrol**

Vancouver (360) 260-6333

**Oregon State**

Department of Environmental Quality

Headquarters (Portland) (503) 229-5153

Northwest Region (Portland) (503) 229-5263

Eastern Region (Bend) (541) 338-6146

Eastern Region (Pendleton) (541) 278-4063

Western Region (Coos Bay) (541) 269-2721

Western Region (Eugene) (541) 686-7838

Western Region (Medford) (541) 776-6010

Western Region (Salem) (503) 378-8240

Emergency Response System (OERS) (503) 378-6377

(800) 452-0311

(In state) (800) OILS-911

Stop Oregon Litter &amp; Vandalism (503) 647-9855



## HOW TO USE THIS GEOGRAPHIC RESPONSE PLAN

### Purpose of Geographic Response Plan (GRP)

**This plan prioritizes resources to be protected and allows for immediate and proper action. By using this plan, the first responders to a spill can avoid the initial confusion that generally accompanies any spill.**

Geographic Response Plans are used during the emergent phase of a spill which lasts from the time a spill occurs until the Unified Command is operating and/or the spill has been contained and cleaned up. Generally this lasts no more than 24 hours. The GRPs constitute the federal on-scene coordinators' and state on-scene coordinators' (Incident Commanders) "orders" during the emergent phase of the spill. During the project phase, the GRP will continue to be used, and the planned operation for the day will be found in the Incident Action Plan's Assignment List (ICS Form 204). The Assignment List is prepared in the Planning Section with input from natural resource trustees, the Incident Objectives (ICS Form 202), Operations Planning Worksheet (ICS Form 215), and Operations Section Chief.

### Strategy Selection

Chapter 4 contains complete strategy descriptions in matrix form, response priorities, and strategy maps. The strategies depicted in Chapter 4 should be implemented as soon as possible, following the priority table in Section 2 with the "Potential Spill Origin" closest to the actual spill origin. These strategy deployment priorities may be modified by the Incident Commander(s) after reviewing on scene information, including: tides, currents, weather conditions, oil type, initial trajectories, etc.

**It is assumed that control and containment at the source is the number one priority of any response.** If, in the responder's best judgment, this type of response is infeasible then the priorities laid out in Chapter 4, Section 2 take precedence over containment and control.

It is important to note that strategies rely on the spill trajectory. A booming strategy listed as a high priority would not necessarily be implemented if the spill trajectory and booming location did not warrant action in that area. However, the priority tables should be followed until spill trajectory information becomes available, and modifications to the priority tables must be approved by the Incident Commander(s).

The strategies discussed in this GRP have been designed for use with persistent oils and may not be suitable for other petroleum or hazardous substance products. For hazardous substance spills, refer to the Northwest Area Contingency Plan, Chapter 7000.

### Standardized Response Language

In order to avoid confusion in response terminology, this GRP uses standard National Interagency Incident Management System, Incident Command System (NIIMS, ICS) terminology and strategy names, which are defined in Appendix A, Table A-1 (e.g. diversion, containment, exclusion).

## Lower Columbia River Geographic Response Plan

## Record of Changes

[illegible]



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## Lower Columbia River, Oregon/Washington

### GEOGRAPHIC RESPONSE PLAN

#### 1. INTRODUCTION: SCOPE OF THIS PROJECT

Geographic Response Plans are intended to help the first responders to a spill avoid the initial confusion that generally accompanies any spill. This document serves as the federal and state on-scene-coordinators "orders" during a spill in the area covered by this GRP (see Chapter 3 for area covered). As such, it has been approved by the U.S. Coast Guard Marine Safety Office and the Washington State Department of Ecology Spills Program. Changes to this document are expected as more testing is conducted through drills, site visits, and actual use in spill situations. To submit comments, corrections, or suggestions please refer to Appendix C.

GRPs have been developed for the marine and inland waters of Washington, Oregon, and Idaho. They are prepared through the efforts and cooperation of the Washington Department of Ecology, Washington Department of Fish and Wildlife, Oregon Department of Environmental Quality, Idaho State Emergency Response Commission, the U.S. Coast Guard, the Environmental Protection Agency, tribes, other state and federal agencies, response organizations, and local emergency responders.

GRPs were developed through workshops involving federal, state, and local oil spill emergency response experts, response contractors, and representatives from tribes, industry, ports, environmental organizations, and pilots. Workshop participants identified resources which require protection, developed operational strategies, and pinpointed logistical support. A similar process has been used for major updates.

Following the workshops, the data gathered was processed and reproduced in the form of maps and matrices which appear in Chapters 4 through 6. The maps in Chapters 5 and 6 were generated using Canvas. Maps for Chapter 4 were generated using ArcView GIS. The matrices were created using MS Excel, and the balance of each GRP was produced using MS Word.

The first goal of a GRP was to identify, with the assistance of the Washington State Natural Resource Damage Assessment Team, resources needing protection; response resources (boom, boat ramps, vessels, etc.) needed, site access and staging, tribal and local response community contacts, and local conditions (e.g. physical features, hydrology, currents and tides, winds and climate) that may affect response strategies. Note that GRPs only address protection of sensitive public resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

Secondly, response strategies were developed based on the sensitive resources noted, hydrology, and climatic considerations. Individual response strategies identify the amount of boom necessary for implementation. The response strategies are then applied to Potential Spill Origins and trajectory modeling, and prioritized, taking into account factors such as resource sensitivity, feasibility, wind, and tidal conditions.

Draft strategy maps and matrices were sent out for review and consideration of strategy viability. Field verification was conducted for some strategies, and changes proposed by the participants were included in a semi-final draft, which was offered for final review to all interested parties and the participants of the field verification.

Finally, the general text of the GRP was compiled along with the site description, reference maps, and logistical support.

Items included in Logistical Support:

- Location of operations center for the central response organization;
- Local equipment and trained personnel;
- Local facilities and services and appropriate contacts for each;
- Site access & contacts;
- Staging areas;
- Helicopter and air support;
- Local experts;
- Volunteer organizations;
- Potential wildlife rehabilitation centers;
- Marinas, docks, piers, and boat ramps;
- Potential interim storage locations, permitting process;
- Damaged vessel safehavens;
- Vessel repairs & cleaning;
- Response times for bringing equipment in from other areas.

## 2. SITE DESCRIPTION

The Lower Columbia River addressed in this GRP includes that lower portion of the Columbia River from Bonneville Dam to the estuary at the mouth of the river, a distance of approximately 145 miles, and the lower Willamette River from Willamette Falls to the confluence with the Columbia, a distance of approximately 26 miles. The lower portion of the 1,210 mile long Columbia River contains an extensive variety of fish, wildlife, and habitat. For this reason, compounded by industry use along its shorelines, larger vessels and increased vessel traffic, this area is highly vulnerable to environmental damage by oil or hazardous materials spills.

Terrain varies from sandy beaches to intermittent rocky areas of rip-rap and intertidal zones with steep cliffs that have limited or no access. The varied stretches of sandy beach represent areas of significant human use. Portions of the riverbank are steep, completely inaccessible rocky cliffs. Other areas are rocky intertidal to cobble type beaches. There are many mid-stream rocks and sand islands that provide bird rookeries and marine mammal haulouts. Interspersed along both the Columbia and Willamette rivers are many small freshwater drainages.

### 2.2. Physical Features

Use of the Columbia River and lower Willamette River waterways throughout the year by many species of wildlife in a variety of stages of development, at locations scattered all along the lower length of the river is well documented. As a result there are 11 major wildlife refuges and state parks located between the Portland/Vancouver area and the Pacific Ocean.

The outflow of the Columbia River forms a vast estuary. This estuary is a meeting point between saltwater and fresh water and the surrounding land. The resulting fragile environment is characterized by highly variable physical, chemical, and biological conditions, allowing organisms from saltwater and fresh water and land to proliferate with great abundance and diversity. Components of this estuary include tidelands, salt marshes, sand spits, uplands, and river channels, all of which interact to create a highly productive habitat.

This GRP addresses the lower 145 miles of the Columbia River and the lower 26 miles of the Willamette River. In addition to the miles of sandy beaches and its sensitive estuary, the Columbia River has its flow augmented by the confluence of the flows from the following creeks and rivers:

**Hamilton Creek** - Hamilton Creek lies approximately 142 miles east of the Columbia River mouth.

**Sandy River** - Sandy River lies approximately 121 miles east of the Columbia River mouth.

**Washougal River** - Washougal River lies approximately 121 miles east of the Columbia River mouth.

**Willamette River** - Willamette River lies approximately 102 miles east of the Columbia River mouth.

**Lake River** - Lake River lies approximately 88 miles east of the Columbia River mouth.

**Lewis River** - Lewis River lies approximately 85.5 miles east of the Columbia River mouth.

**Kalama River** - Kalama River lies approximately 73 miles east of the Columbia River mouth.

**Cowlitz River** - Cowlitz River lies approximately 68 miles east of the Columbia River mouth.

**Mill/Germany/Abernathy Creeks** - Mill/Germany/Abernathy Creeks lie approximately 55 miles east of the Columbia River mouth.

**Clatskanie River** - Clatskanie River lies approximately 50 miles east of the Columbia River mouth.

**Elochoman River** - Elochoman River lies approximately 41 miles east of the Columbia River mouth.

**Skamokawa Creek** - Skamokawa Creek lies approximately 33 miles east of the Columbia River mouth.

**Big Creek** - Big Creek lies approximately 28 miles east of the Columbia River mouth.

**Crooked Creek** - Crooked Creek lies approximately 23 miles east of the Columbia River mouth in Grays Bay.

**Grays River** - Grays River lies approximately 22.5 miles east of the Columbia River mouth in Grays Bay.

**Deep River** - Deep River lies approximately 21 miles east of the Columbia River mouth in Grays Bay.

**John Day River** - John Day River lies approximately 18 miles east of the Columbia River mouth.

**Youngs River** - Youngs River lies approximately 13.5 miles east of the Columbia River mouth in Youngs Bay.

**Lewis & Clark River** - Lewis & Clark River lies approximately 13 miles east of the Columbia River mouth in Youngs Bay.

**Chinook River** - Chinook River lies approximately 5 miles east of the Columbia River mouth in Baker Bay.

**Wollacut River** - Wollacut River lies approximately 4 miles east of the Columbia River mouth in Baker Bay.

Significant tributaries to the Willamette River include:

**Clackamas River** - Clackamas River lies approximately 25 miles south of the Willamette River mouth.

**Oswego Creek** - Oswego Creek lies approximately 21 miles south of the Willamette River mouth.

**Johnson Creek** - Johnson Creek lies approximately 19 miles south of the Willamette River mouth.

**Kellogg Creek** - Kellogg Creek lies approximately 19 miles south of the Willamette River mouth.

This additional water volume, along with the natural water disturbances created by the variances of the riverbank and current flow, create numerous rips, back eddies, and still waters. These will cause the spilled oil to concentrate at various points along the rivers. The oil will also tend to strand and ground at the high water line on a falling tide and on the outside of bends.

### 2.3. Hydrology

Because of the density differences between the fresh water flowing downriver and the salt water driven upriver by tidal forces, a two-layered system or "tidal wedge" develops in the Columbia River, where the surface current moves downstream and the bottom, saltier water moves upstream. This wedge can be apparent as far upriver as Tongue Point (rm 18) and is usually associated with a turbidity maximum.

### 2.4. Currents and Tides

Water levels and velocities in the Lower Columbia River are a function of several factors: seasonal runoff, tidal effects, and the volume of water released by upstream dams. Information from several sources have been included in an effort to give a general view of the river conditions.

Tides: The tides of the Pacific Northwest are semidiurnal - meaning there are two high waters and two low waters each tidal day. Tidal effects on the Columbia River can be felt during low river flow up to Warrendale, Oregon (approximately River Mile 141). Data for stations above Harrington Point apply only during low river stages. The tidal range for the Columbia River is greatest near the mouth, with the tidal influence decreasing upriver. The mean tidal range (MHW-MLW) at Astoria is 6.6 feet and the diurnal range (MHHW-MLLW) is 8.4 feet. The mean tidal range at Warrendale, Oregon is 0.4 feet and the diurnal range is 0.6 feet.<sup>1</sup>

Currents: The tidal current in the Columbia River is always modified by the river discharge, sometimes to the extent that the flood current is indiscernible and the current ebbs continuously. The lower Columbia River is subject to annual freshets (flooding) in the late fall and early winter when rains are the heaviest. Short range predictions on river flow are available from the NOAA Weather Service Northwest River Forecast Center in Portland, Oregon.

Multnomah Channel Effect: The Multnomah Channel runs from the Willamette River to the Columbia River on the southwest side of Sauvie Island. During the spring and early summer when flow rates down the Columbia River are high, the water level of the Columbia River may be higher than the water level in the Willamette River at their confluence. When this occurs, part of the Columbia River will actually flow up the Willamette River until it reaches the Multnomah Channel. At this point, the combined flow of both rivers will be directed downstream through Multnomah Channel until it converges again with the main stream of the Columbia River.

Oil spilled in the Willamette River or on the Columbia upriver from the Willamette confluence will flow down the Multnomah Channel. At the Willamette River/Multnomah Channel confluence, the converging currents create a slack water which tends to disperse the pollutants to both sides of the Willamette River.

The average surface water velocity for the lower Columbia River at Vancouver is 1 - 1.5 knots downstream. Surface water velocity in the lower Columbia at low summer/fall flow is 0.5 knots upstream on an incoming high tide, and 1.0 knots downstream on an outgoing low tide.

The average surface water velocity for the Willamette River at Portland is 0.5 knots downstream. Surface water velocity in the Willamette River at low summer/fall flow is 0.3 knots upstream on an incoming high tide, and 0.5 knots downstream on an outgoing low tide.<sup>2,3</sup>

<sup>1</sup> National Oceanic and Atmospheric Administration, 1995. Tide Tables West Coast of North & South America.

<sup>2</sup> National Oceanic and Atmospheric Administration, 1995. Tide Tables Pacific Coast of North & South America.

<sup>3</sup> Columbia River Pilots Assn. March 9, 1995. Presentation at Columbia River Oil Transfer Location Workshop.

## 2.5. Winds

The northern coast can be affected by strong winds, at times in excess of 100 miles per hour. These winds typically come from the north to northwest in the summer and the southeast to east in the winter. During the summer, the predominant wind direction is from the northwest with speeds ranging from 10 to 15 knots. However maximum peak wind gusts range from 30 to 40 knots. The mean wave heights are about 4.9 feet with maximum heights of 14.7 feet. In the winter, the winds are primarily from the east to southeast at 10 to 15 knots with maximum peak wind gusts ranging from about 55 to 65 knots. Average wave heights are 4.9 feet with maximum wave heights of 32.8 feet. In particular, the coastal mountain range deflects winds so that they tend to flow parallel to the coastline. In areas with lower mountains, this effect may not be as prominent. Winds in Astoria and Portland have an annual mean velocity of 8 knots with directions varying throughout the year.

## 2.6. Climate

The entire coast is characterized by a maritime climate with cool summers and mild winters. Air temperatures are in the mid 40's in the winter and the low 60's in the summer. Water temperatures are fairly constant, normally in the low 50's. Annual rainfall varies between Astoria and Portland. Astoria averages 66.34" per year and Portland averages 37.61" per year.

## 2.7. Risk Assessment

### **VESSELS**

The primary transportation patterns for the Trans-Alaskan Pipeline Trade that affect the Oregon Coast are between Prince William Sound and Richmond, California. The routes for major shipping traffic keep the super tankers 50-60 NM off shore. This distance is believed to minimize coastal effects from a catastrophic spill.

Refined product in barges and small tankers is transported closer to the shoreline and up the Columbia River as far as Pasco, Washington. There are on the average, 160 tank barge movements as well as 50-60 bunkering operations by barge to a variety of vessels per month. The majority of these bunker barges have a capacity of 15,000 bbls.

Annually, self propelled tankers make approximately 100 port calls to the Portland area. The majority of the tank vessels are approximately 39,000 dwt tonnage, having capacity of approximately 275,000 bbls, although the largest have a capacity of 400,000 bbls. Supertankers in ballast also transit the river enroute the Portland Ship yard for routine inspections and maintenance. Approximately 2,000 general cargo, bulk, and container vessels enter the river annually, carrying bunker fuels of approximately 15,000 barrels capacity.

The largest spill in Columbia River history occurred in 1984 when the T/V Mobiloil ran aground on Warrior Rock near the north end of Sauvie Island. This grounding allowed for the spewing of 200,000 gallons of refined oil to the surrounding area. The 1979 *Oil Spill Protection Plan for the Natural Resources of the Lower Columbia and Willamette Rivers* published by DEQ was implemented and cleanup ensued. There was still not an abundance of cleanup equipment positioned along the river at this time, so response was hampered.

More recently this river system has fallen prey to a series of bunkering and cargo transfer related spills, the largest of which was the 11,000 gallon discharge of Intermediate Fuel Oil (IFO) 380 from the M/V Tai Chung at the Columbia Aluminum Facility along the Willamette River (RM 10) just upstream of Swan Island in December of 1991. The product was a thick, viscous oil with high persistency on the affected shoreline. Two similar bunkering mishaps occurred within six months of each other at Longview Anchorage (RM 65).

The M/V Central spewed approximately 3,000 gallons of IFO 180 on the morning of June 3, 1993, when the fill valve to tank 5 starboard was not fully closed. This allowed fuel to continue entering the tank unknown to the vessel's crew, until it flowed from the tanks on deck vent and over the side. High river discharge kept the majority of oil in the main navigational channel and flushed it downriver.

Six months later, on January 10, 1994, the M/V An Ping 6 replayed the events of M/V Central and spilled a similar amount of product at the same location. River discharge was 1/3 the volume of the earlier incident, and portions of the Washington shoreline were badly impacted. Heaviest oiling was found in and around Fisher Island, and cleanup lasted a full 30 days. Response mechanisms were in place by this time and boom and skimmers were deployed as part of the Maritime Fire and Safety Association's Vessel Umbrella Contingency Plan.

A series of other bunker and transfer related spills have plagued the Columbia River, usually with a lighter, less persistent product. Routine training by the covered facilities, the Clean Rivers Cooperative, Maritime Fire and Safety Association, and various contractors helps ensure discharges will be efficiently contained and recovered.

### ***FACILITIES***

Both the Columbia and Willamette Rivers are home to many oil facilities. Very little crude oil is transported to these facilities, with the majority being refined products heading to the large tank farms along the lower Willamette. Over half the oil transported to the region daily comes through pipeline, which crosses the river at various locations.

Of the approximately 30 facilities in this region, the smallest have 1 surface tank with a volume of 10,000 bbls whereas the largest facilities have as many as 100 surface tanks with a capacity of 1.8 million bbls. Many of these tanks are kept within unlined, earthen secondary containment berms capable of holding 100% of the tank contents. These facilities may be vulnerable to natural disasters, equipment failures, and other catastrophes that could lead to a partial or complete loss of tank contents. As a result of recent state and federal legislation, most facilities maintain several thousand feet of harbor and sorbent boom and a means of deployment on site.

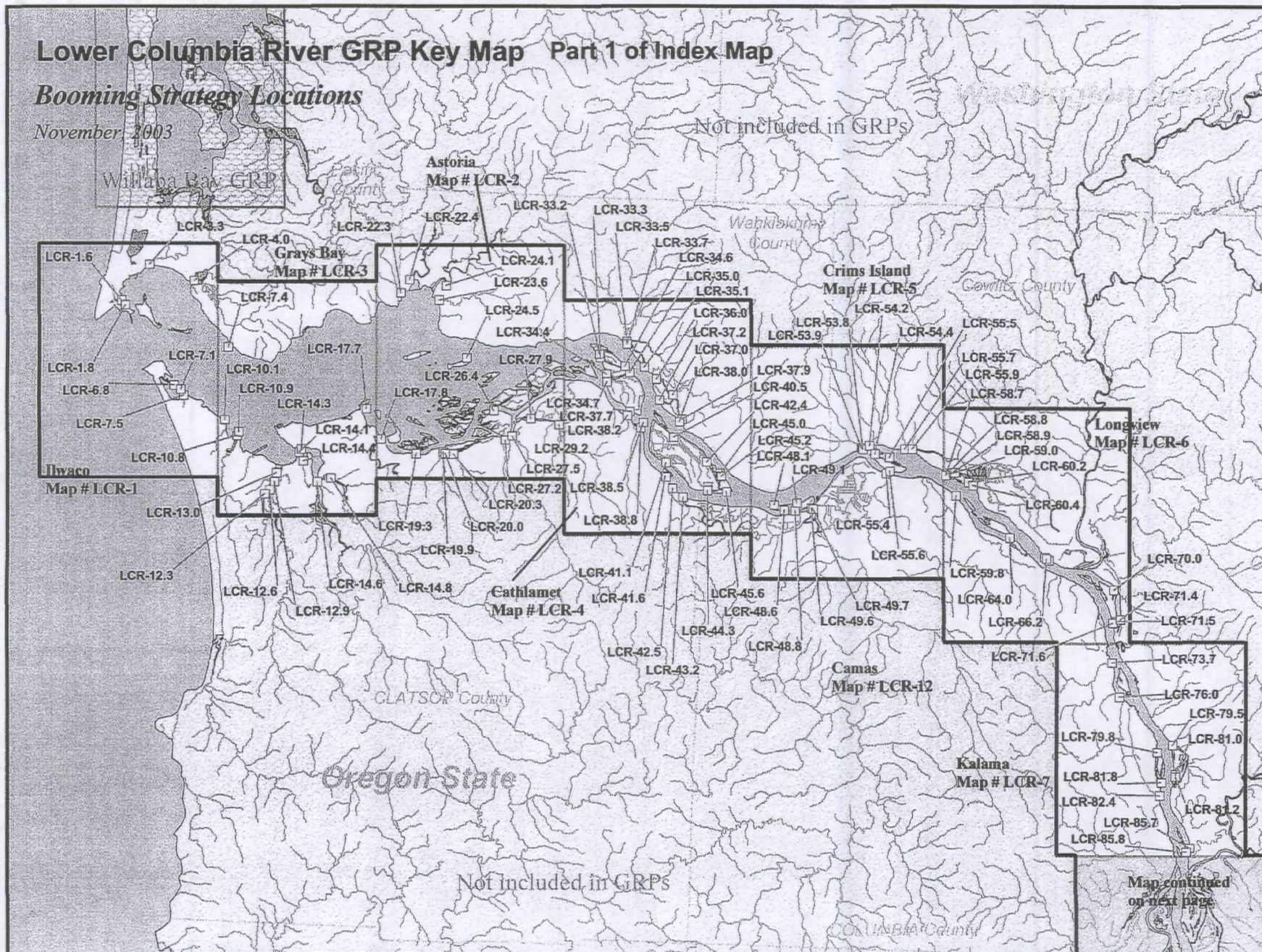
With a river current in excess of one knot and sometimes 2 - 3 knots, the time frame in which to respond to contain and/or divert moving oil is very short. History has shown that oil can move from the Port of Vancouver area to the mouth of the Columbia River in less than three days. Boom identified in planning workshops require 54,400 feet of boom to implement all the response strategies.



# Lower Columbia River GRP Key Map Part 1 of Index Map

## Booming Strategy Locations

November 2003





# Lower Columbia River GRP Key Map

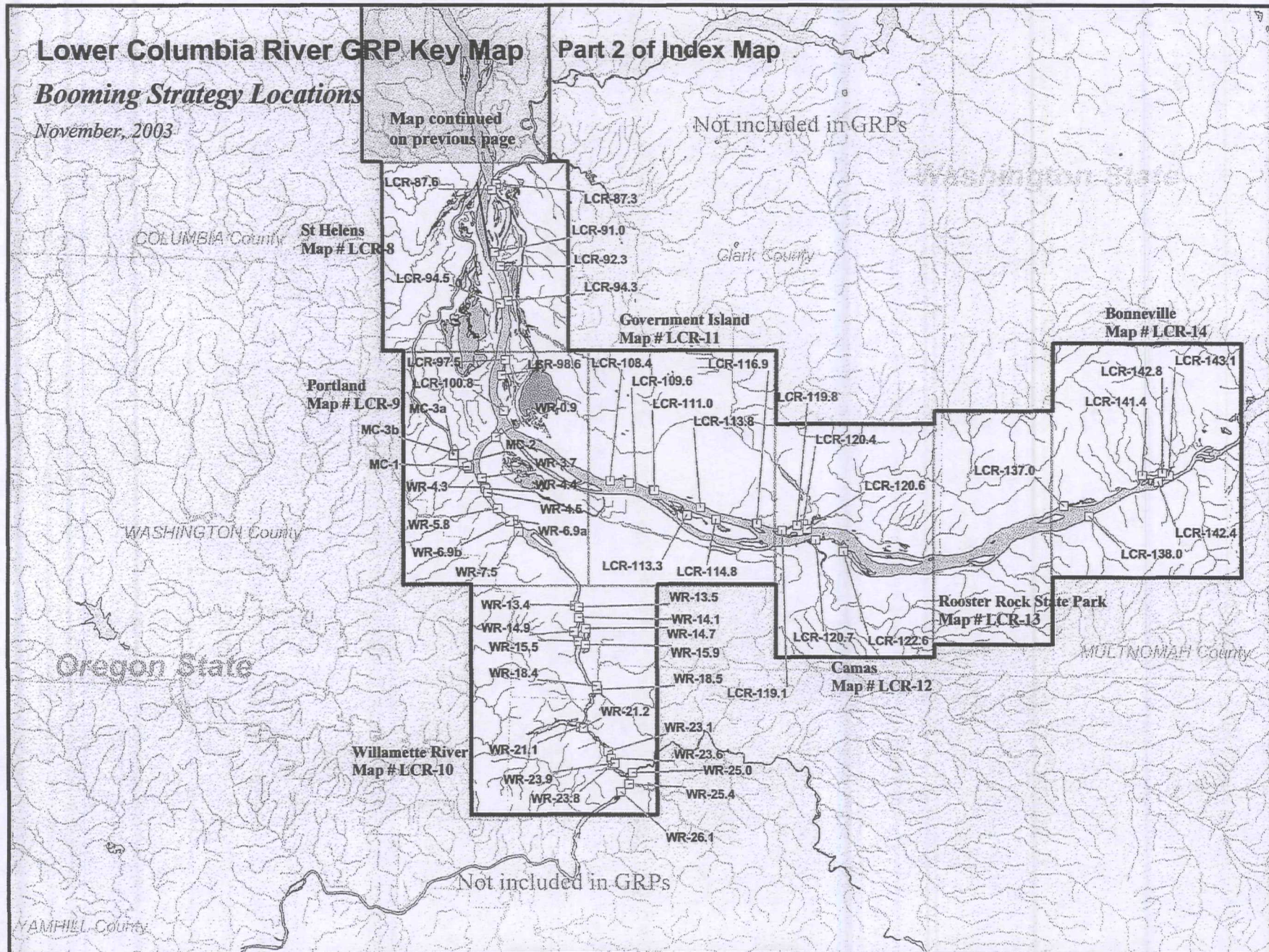
## Part 2 of Index Map

### Booming Strategy Locations

November, 2003

Map continued  
on previous page

Not included in GRPs





## 4. GENERAL PROTECTION/COLLECTION STRATEGIES

### 4.1. Chapter Overview

This chapter details the specific response strategies and resources to protect as outlined by the participants of the GRP workshop for the Central Puget Sound area. It describes the strategies determined for each area and the prioritization of those strategies. Note that GRPs only address protection of sensitive public resources. It is the responsibility of private resource owners and/or potentially liable parties to address protection of private resources (such as commercial marinas, private water intakes, and non-release aquaculture facilities).

#### Maps & Matrices

The maps in this chapter provide information on the specific location of booming strategies. They are designed to help the responder visualize response strategies. Details of each booming strategy are listed in corresponding matrix tables. Strategies are numbered based on river mile. River miles are calculated at the center of the shipping channel, so strategies were numbered by drawing a perpendicular line from the strategy position to the center of the shipping channel. Each matrix indicates the exact location, intent and implementation of the strategy indicated on the map. The "Status" column describes whether the strategy has been visited or tested in the field, and the date of the visit/test. Strategies in the estuary on the Washington side include a number for the corresponding shoreline photo, which is available on the Washington Department of Ecology's internet site at <http://www.ecy.wa.gov/apps/shorephotos/>.

#### Major Protection Techniques

All response strategies fall into one of three major techniques that may be utilized either individually or in combination. The strategies listed in Section 4.2 are based on the following techniques, and are explained in detail in Section 4.3:

**Dispersants:** Washington State Policy currently does not allow use of dispersants in this area. Certain chemicals break up slicks on the water. Dispersants can decrease the severity of a spill by speeding the dissipation of certain oil types. Their use will require approval of the Unified Command. Dispersants will only be used in offshore situations under certain conditions, until further determinations are made by the Area Committee and published in the Area Contingency Plan.

**In Situ Burning:** Approval to burn in this area is unlikely due to the proximity of population to a potential burn site. Burning requires the authorization of the Unified Command, who determine conformance of a request to burn with the guidelines set forth in the Area Plan. This option is preferable to allowing a slick to reach the shore provided that population areas are not exposed to excessive smoke. Under the right atmospheric conditions, a burn can be safely conducted in relative close proximity to human population. This method works on many types of oil, and requires special equipment including a fire boom and igniters.

**Mechanical Recovery and Protection Strategies:** If a spill is too close to shore to use In Situ burning or dispersants, the key strategies are skimming and use of collection, diversion, or exclusion booming to contain and recover the oil, and prevent it from entering areas with sensitive wildlife and fisheries resources. These options are described in detail in Appendix A. Specific skimming strategies are not listed in the maps and matrices, but skimming should be used whenever possible and is often the primary means of recovering oil and protecting resources, especially when booming is not possible or feasible.

## 4.2 Booming Strategy Priority Tables

Strategy priorities were developed for each map page in the GRP. For each page-related table, it was assumed that the spill was moving downstream, starting at the upstream end of the map page segment. For spills occurring within a map page, only the strategies downstream of the spill should be deployed. Attempt to determine where the oil is using real-time observations, and begin strategy deployments ahead of the oil. The priority tables were generated based on the assumption that the oil is primarily "current driven" versus "wind driven".

Elements taken into account in developing the priority tables included the following:

- Relative natural resource values of areas
- Relative amount of natural resource protection afforded by a given strategy
- Special protection status of certain areas (e.g., USFWS refuge)
- Whether a given strategy was the primary means of protecting an area or a secondary strategy
- Perceived likelihood of a given area being oiled, based on experience with past spills
- Perceived likelihood of a given strategy being able to provide the resource protection for which it was intended (e.g., exclusion versus deflection)

The booming strategies indicated in the priority tables are explained in detail in the Maps & Matrices section (Section 4.3.). It is implied that control and containment at the source is the number one priority of any response. If in the responder's best judgment this is not feasible, then the priorities laid out in the priority tables take precedence over containment and control.

## 4.2.1 Lower Columbia River Priority Tables

Map # 1 - Ilwaco	
Priority	Strategy Number
1	LCR-7.1
2	LCR-6.8
3	LCR-7.5
4	LCR-4.0
5	LCR-3.3
6	LCR-1.8
7	LCR-1.6

Map # 2 - Astoria	
Priority	Strategy Number
1	LCR-17.7
2	LCR-14.1
3	LCR-13.0
4	LCR-10.8
5	LCR-14.6
6	LCR-14.8
7	LCR-14.3
8	LCR-12.9
9	LCR-12.6
10	LCR-12.3

Map # 3 - Grays Bay	
Priority	Strategy Number
1	LCR-26.4
2	LCR-24.1
3	LCR-22.4
4	LCR-22.3
5	LCR-23.6
6	LCR-17.8
7	LCR-27.5
8	LCR-27.2
9	LCR-20.3
10	LCR-20.0
11	LCR-19.9
12	LCR-19.3

Map # 4 - Cathlamet	
Priority	Strategy Number
1	LCR-37.9
2	LCR-37.2
3	LCR-36.0
4	LCR-35.0
5	LCR-34.6
6	LCR-34.7
7	LCR-34.4
8	LCR-33.3
9	LCR-32.2
10	LCR-38.8
11	LCR-38.5

Map # 5 - Crims Island	
Priority	Strategy Number
1	LCR-55.5
2	LCR-54.4
3	LCR-55.9
4	LCR-55.7
5	LCR-54.2
6	LCR-53.9
7	LCR-49.1
8	LCR-48.1
9	LCR-55.6
10	LCR-55.4
11	LCR-48.8
12	LCR-48.6
13	LCR-49.4

Map # 6 - Longview	
Priority	Strategy Number
1	LCR-64.0
2	LCR-71.4
3	LCR-70.0
4	LCR-58.7
5	LCR-58.9
6	LCR-60.2

## 4.2.1 Lower Columbia River Priority Tables

<b>Map # 7 – Kalama</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	LCR-81.2
2	LCR-81.0
3	LCR-81.8
4	LCR-82.4
5	LCR-79.5
6	LCR-79.8
7	LCR-76.0
8	LCR-73.7

<b>Map # 8 – St. Helens</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	LCR-94.3
2	LCR-92.3
3	LCR-91.0
4	LCR-87.6
5	LCR-94.5
6	LCR-87.3

<b>Map # 9 – Portland</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	LCR-100.8
2	LCR-98.6
3	LCR-97.5
4	WR-0.9

<b>Map # 11 – Government Island</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	LCR-114.8
2	LCR-113.3

<b>Map # 12 – Camas</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	LCR-120.6
2	LCR-122.6
3	LCR-120.7
4	LCR-119.1

<b>Map # 14 – Bonneville</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	LCR-142.8
2	LCR-141.4
3	LCR-137.0
4	LCR-143.1
5	LCR-142.4

**4.2.2 Willamette River/ Multnomah Channel Priority Tables**

<b>Map # 9 – Portland</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	MC-2
2	MC-1
3	WR-0.9
4	WR-7.5
5	WR-6.9a & b
6	WR-5.8
7	MC-3a & b
8	WR-4.5
9	WR-3.7

<b>Map # 10 – Willamette River</b>	
<b>Priority</b>	<b>Strategy Number</b>
1	WR-26.1
2	WR-25.4
3	WR-25.0
4	WR-23.9
5	WR-23.8
6	WR-23.6
7	WR-23.1
8	WR-21.2
9	WR-18.5
10	WR-18.4



# Ilwaco MAP

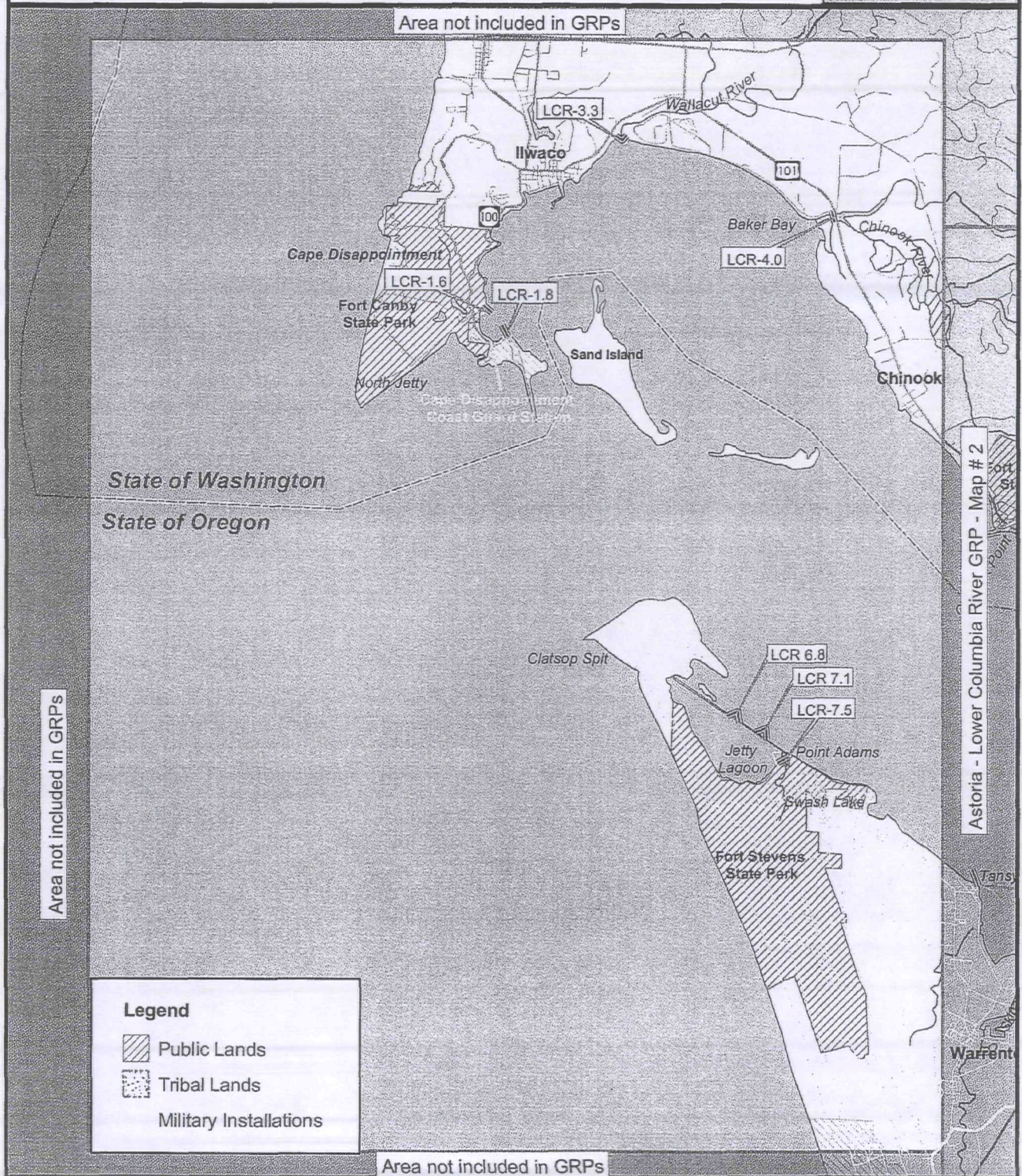
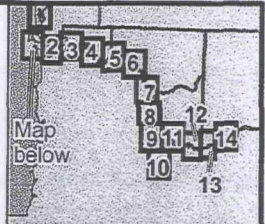
## Proposed Booming Strategies

August, 2003

## Lower Columbia River GRP

### MAP # 1

0 0.5 1 2 Miles





# Astoria MAP

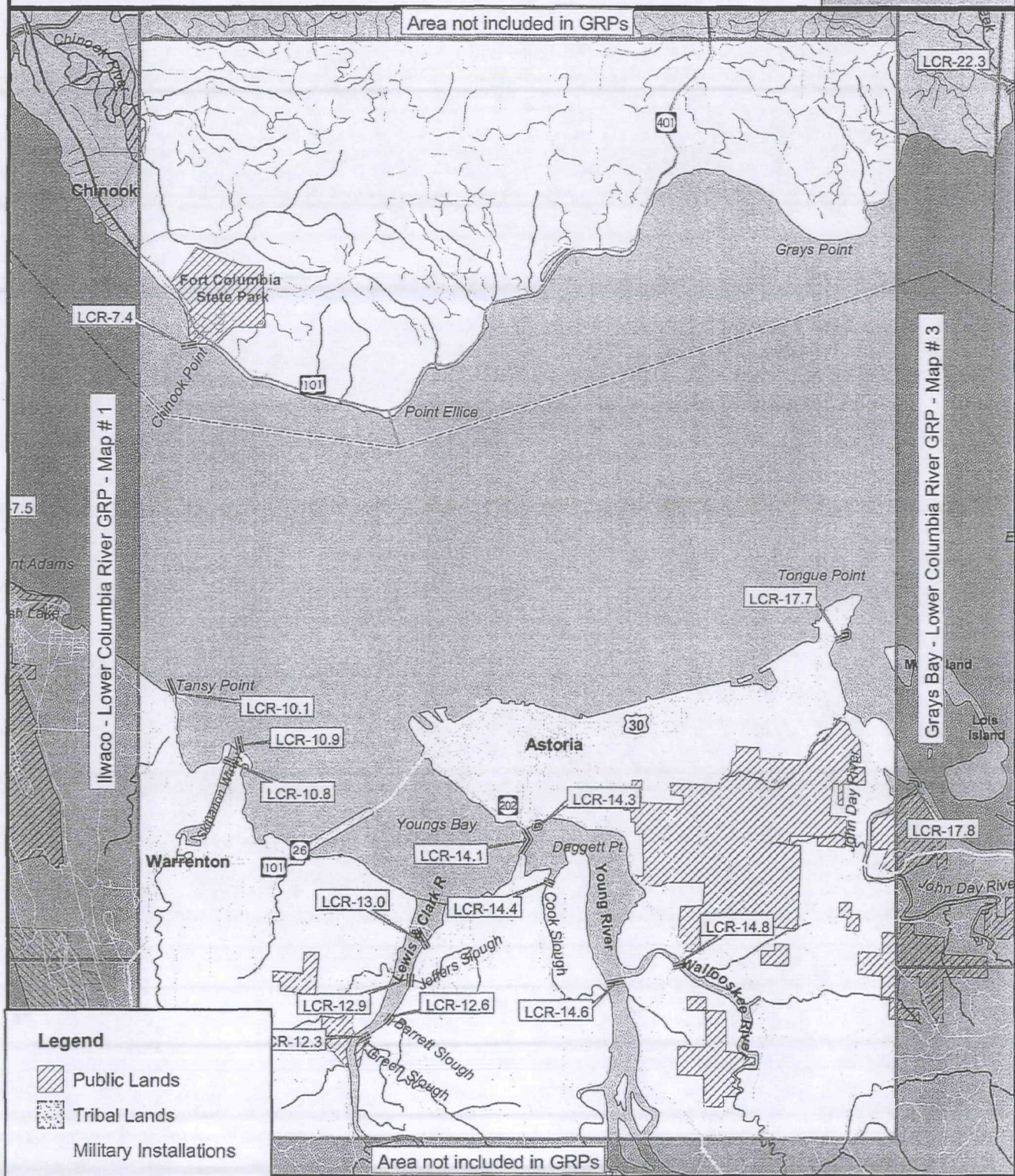
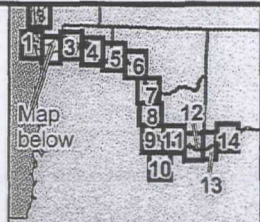
## Proposed Booming Strategies

August, 2003

## Lower Columbia River GRP

### MAP # 2

0 0.5 1 2 Miles



Ilwaco - Lower Columbia River GRP - Map # 1

Grays Bay - Lower Columbia River GRP - Map # 3



# Grays Bay MAP

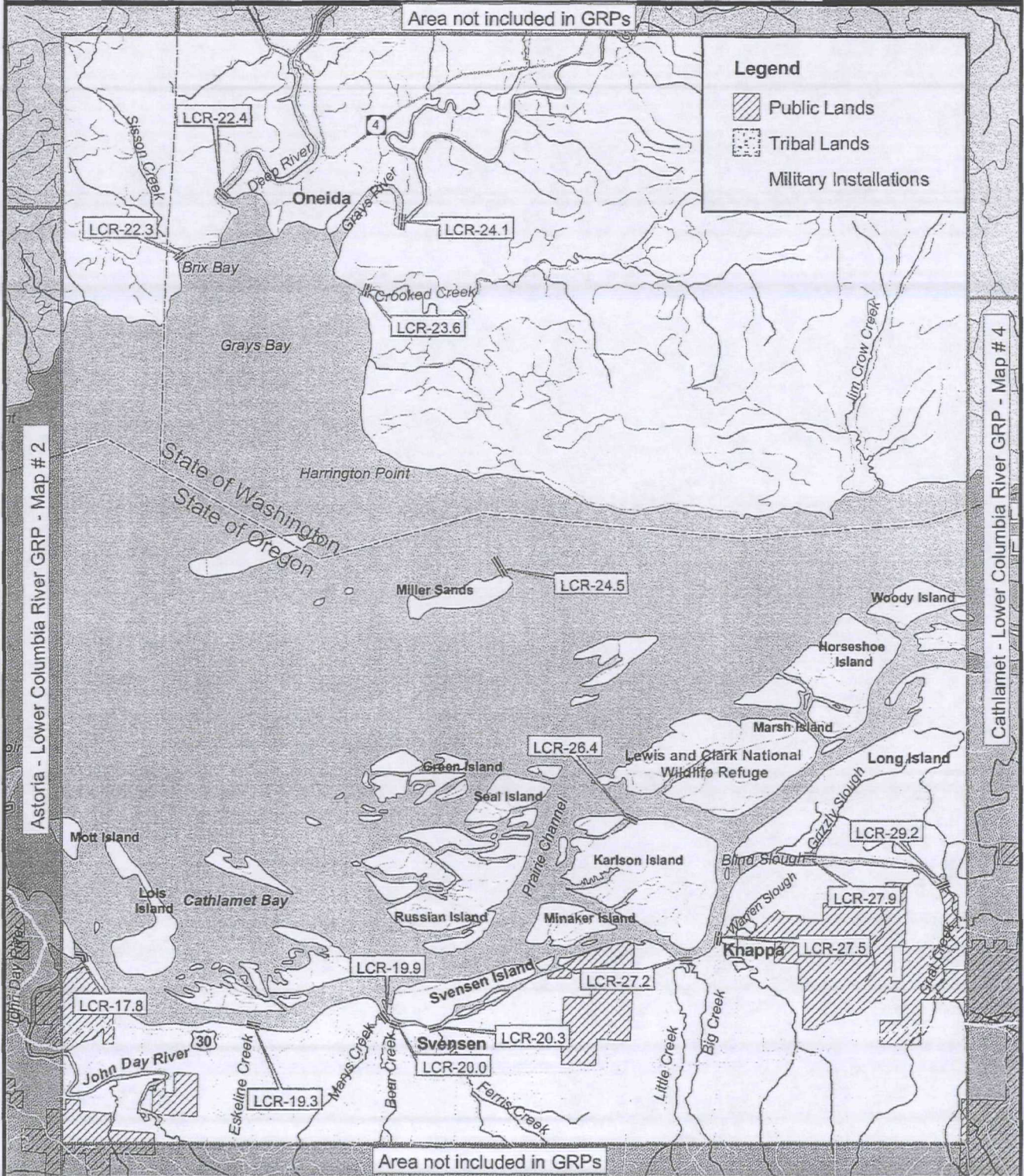
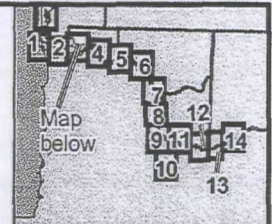
## Proposed Booming Strategies

August, 2003

# Lower Columbia River GRP

## MAP # 3

0 0.5 1 2 Miles



Astoria - Lower Columbia River GRP - Map # 2

Cathlamet - Lower Columbia River GRP - Map # 4



# Cathlamet MAP

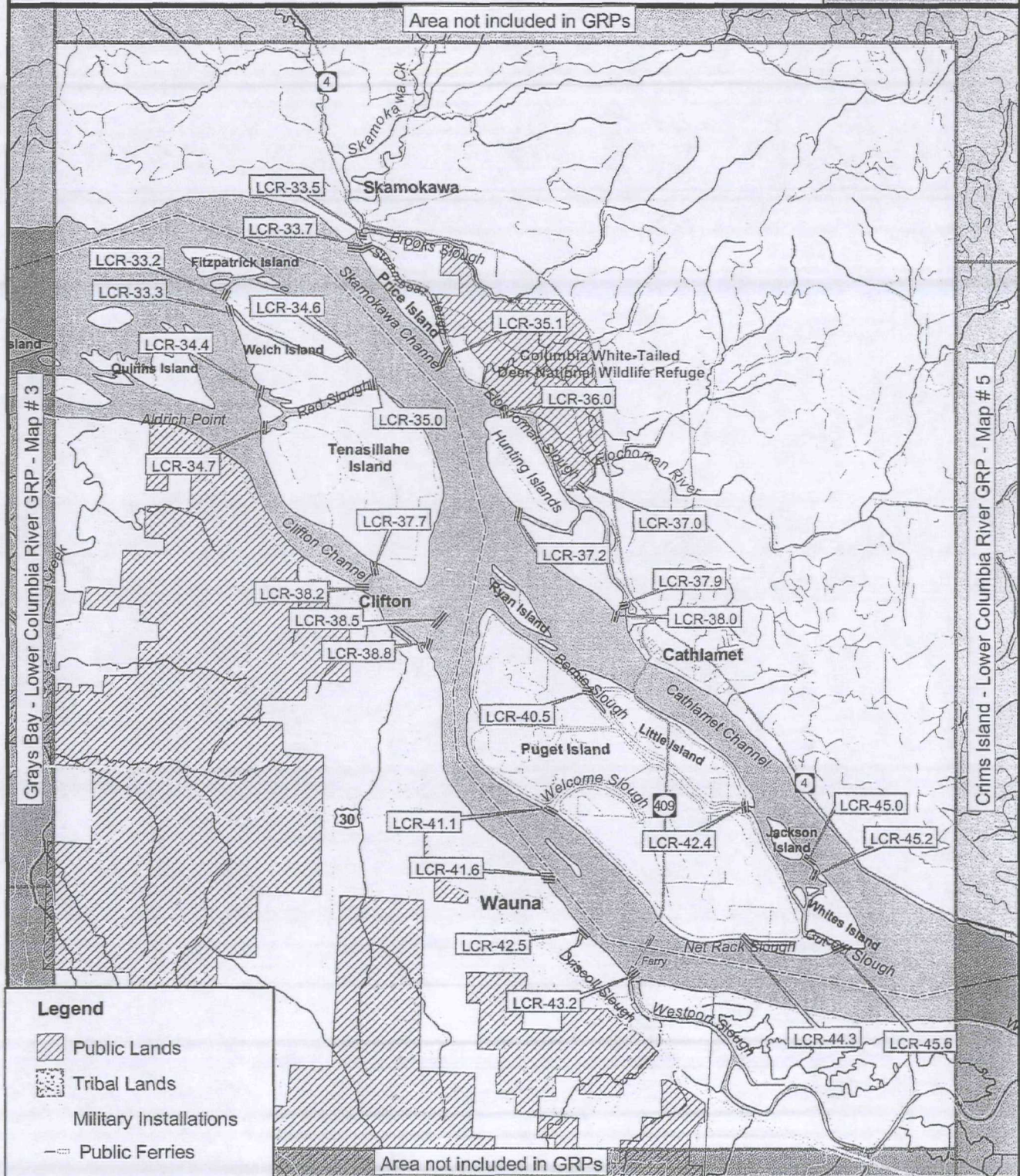
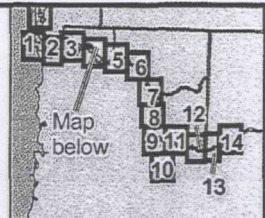
## Proposed Booming Strategies

August, 2003

# Lower Columbia River GRP

## MAP # 4

0 0.5 1 2 Miles



Grays Bay - Lower Columbia River GRP - Map # 3

Crims Island - Lower Columbia River GRP - Map # 5



# Crims Island MAP

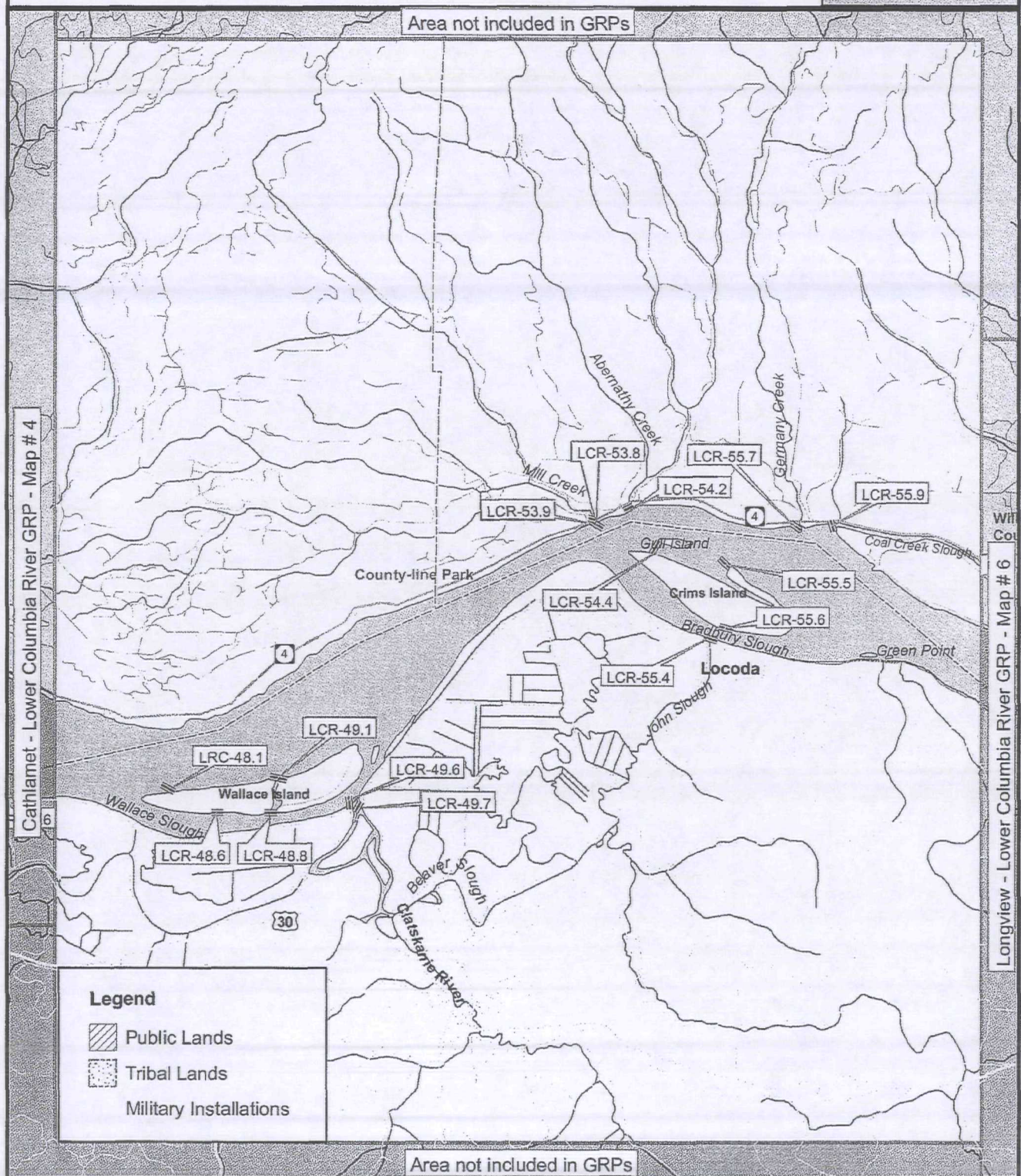
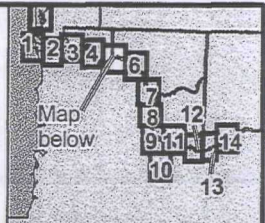
## Proposed Booming Strategies

August, 2003

### Lower Columbia River GRP

#### MAP # 5

0 0.5 1 2 Miles



Cathlamet - Lower Columbia River GRP - Map # 4

Longview - Lower Columbia River GRP - Map # 6



# Longview MAP

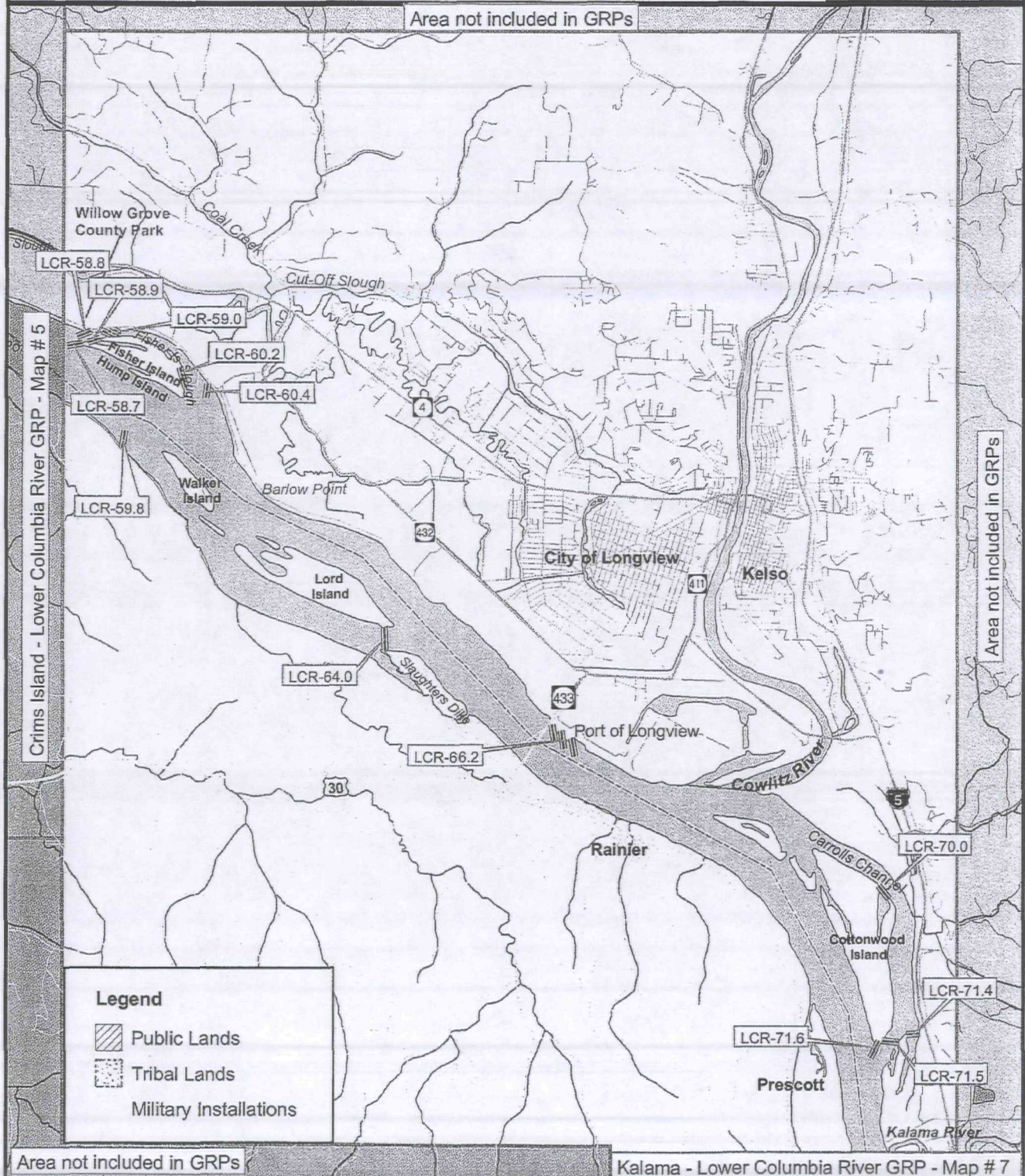
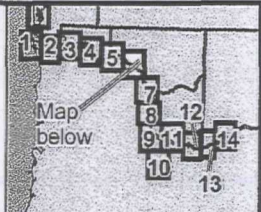
## Proposed Booming Strategies

August, 2003

# Lower Columbia River GRP

## MAP # 6

0 0.5 1 2 Miles





# Kalama MAP

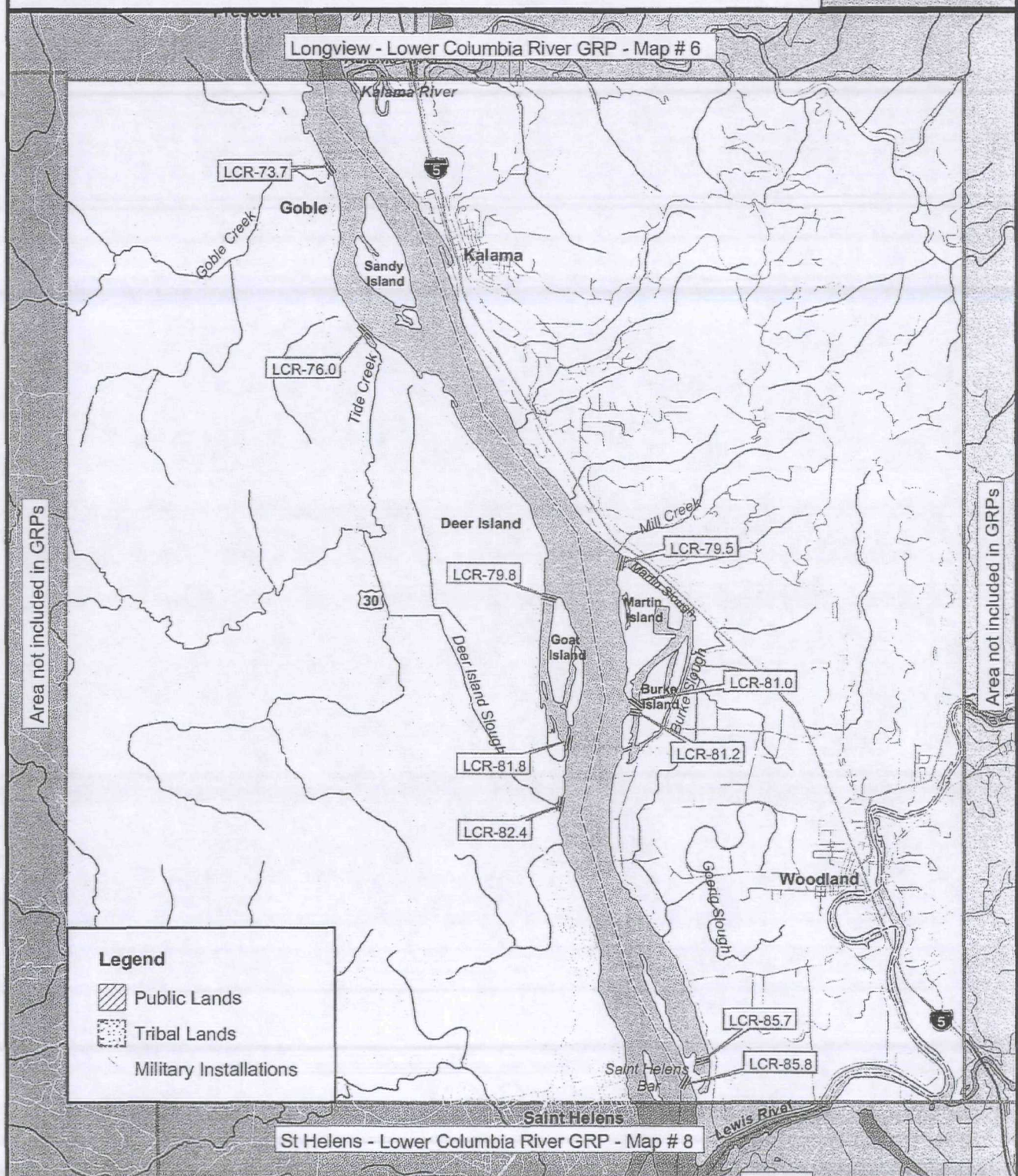
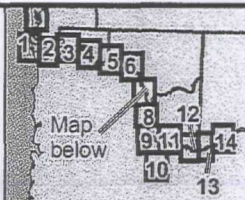
## Proposed Booming Strategies

August, 2003

## Lower Columbia River GRP

### MAP # 7

0 0.5 1 2 Miles

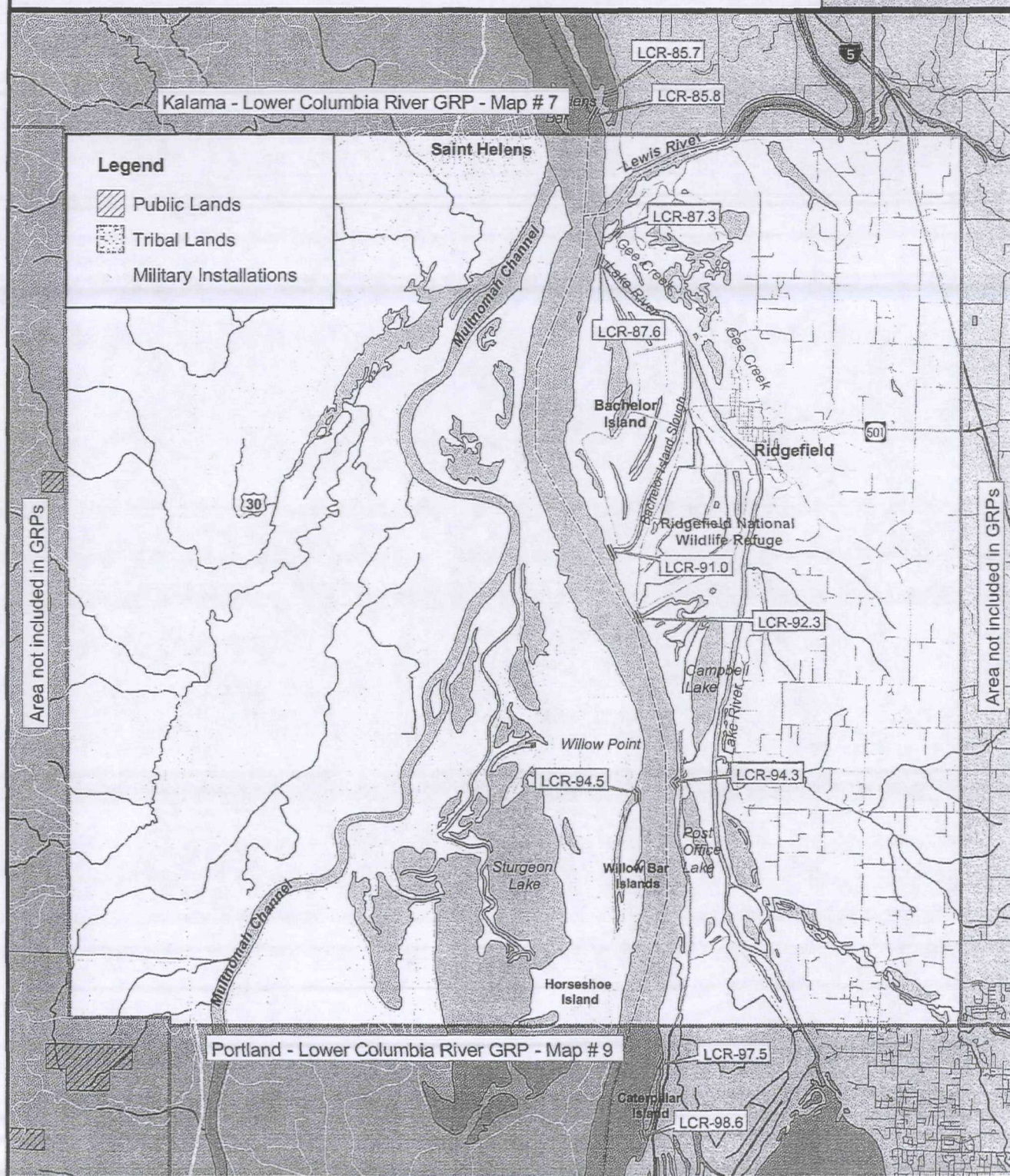
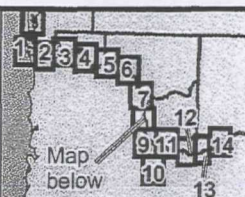




### Proposed Booming Strategies

## Lower Columbia River GRP

0 0.5 1 2 Miles





# Portland MAP

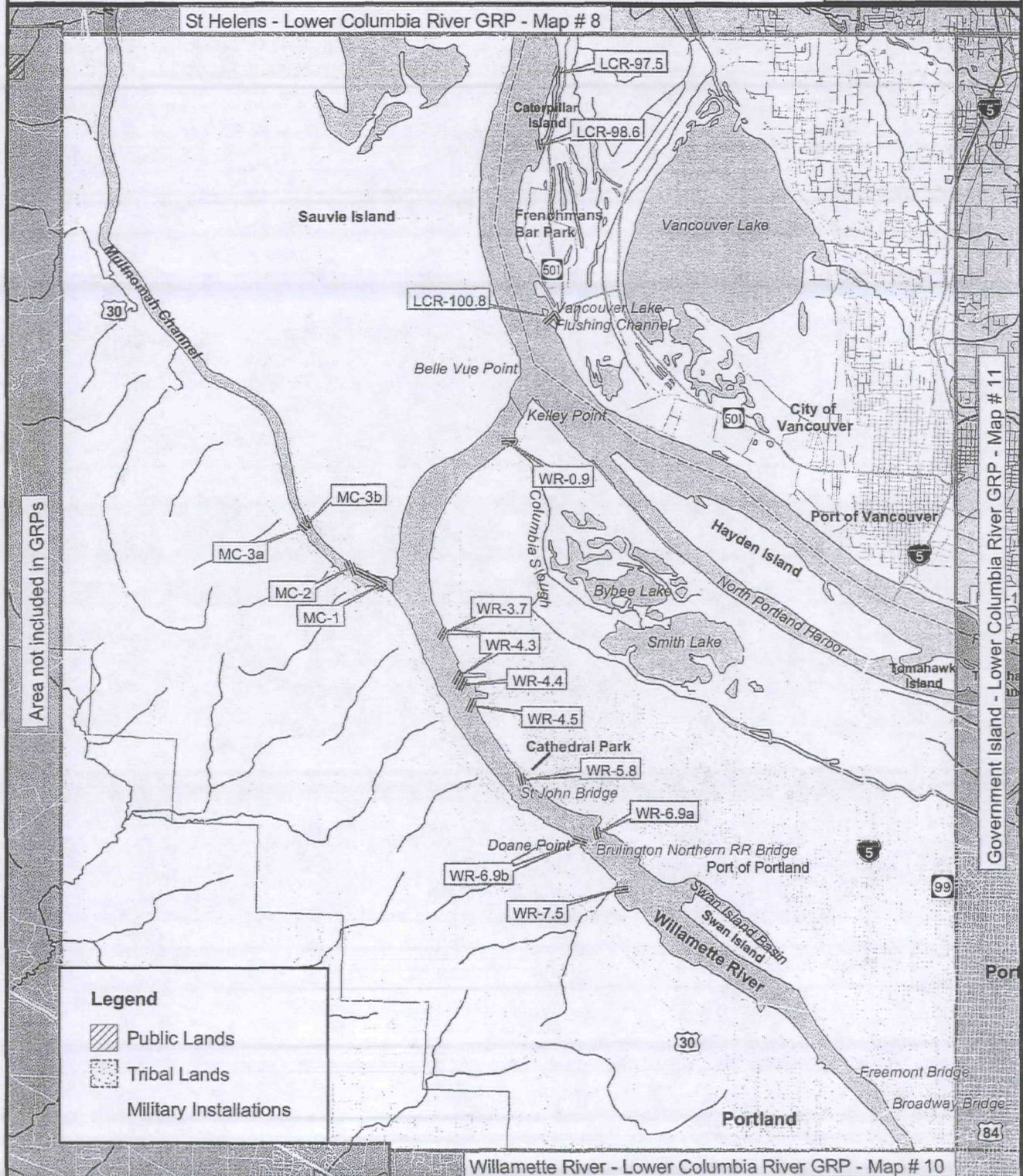
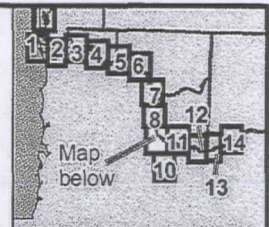
## Proposed Booming Strategies

August, 2003

# Lower Columbia River GRP

## MAP # 9

0 0.5 1 2 Miles





4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-1.6	Field visit 4/94	Fort Canby State Park (WA) PAC0570 46°-17.130'N 124°-03.017'W	Diversion / Collection - Protect eelgrass beds.	Any flow	300'	Angle from daymarker "15" to divert oil into natural collection point near Fort Canby boat launch. Strategy is designed for flood tide only.	Fort Canby State Park (will not be available during Buoy 10 fishery) and/or USCG Station Cape Disappointment.	By boat from the Fort Canby boat launch.	Eelgrass beds, Baker Bay is important year-round; herring spawning occurs in June.
LCR-1.8	Field visit 4/94	USCG Station Cape Disappointment (WA) PAC0568 46°-16.853'N 124°-02.719'W	Diversion / Collection - Protect eelgrass beds.	Any flow	300'	Angle from station to divert oil into natural collection point near Fort Canby boat launch. Strategy is designed for flood tide only.	USCG Station Cape Disappointment.	Fort Canby boat launch and/or USCG Station.	Eelgrass beds, Baker Bay is important year-round; herring spawning occurs in June.
LCR-3.3	Field visit 4/94	Wallacut River (WA) PAC0568 46°-16.853'N 124°-02.719'W	Exclusion - Keep oil out of river.	Any flow	200'	Close off mouth of river. Tide gates over Wallacut R. on Stringtown Rd. may act as barrier to oil. Minimize disturbance of shoreline and back-beach areas around river mouth. Use established roads only for vehicle access.	Ilwaco and/or USCG Station Cape Disappointment.	Best access by road on private property. Take 101 toward Ilwaco, just past Stringtown Rd turn left onto property with blue corrugated steel building (may need to carry boat to river edge from road)	Sensitive shoreline and back-beach around river mouth, wetland.
LCR-4.0	Field visit 4/94	Chinook River (WA) PAC0568 46°-16.853'N 124°-02.719'W	Exclusion - Protect river and wetlands.	Any flow	200'	Close off mouth of river. Tide gates at bridge over Chinook R. on Hwy 101 may act as a barrier to oil.	Ilwaco and/or USCG Station Cape Disappointment.	101 to Ilwaco, left on Stringtown Rd. just after crossing the Chinook River bridge. Can reach river via small access road on the left (may need to carry boat to rivers edge).	Wetland habitat.

## 4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-6.8	New strategy 11/03	Jetty Lagoon-west opening (OR) 46°-12.990'N 123°-58.960'W	Exclusion - Keep oil out of the lagoon.	Any flow	200'	Deploy boom in a chevron configuration on the river side of the west jetty opening. Flow through the opening can be high during tidal exchanges, add boom as necessary to prevent entrainment. Opening position needs to be verified.	Port of Astoria, Pier 2.	Boat access only.	Waterfowl & shorebirds, wetland habitat, juvenile salmonids.
LCR-7.1	New strategy 11/03	Jetty Lagoon-east opening (OR) 46°-12.870'N 123°-58.640'W	Exclusion - Keep oil out of the lagoon.	Any flow	200'	Deploy boom in a chevron configuration on the river side of the west jetty opening. Flow through the opening can be high during tidal exchanges, add boom as necessary to prevent entrainment. Opening position needs to be verified.	Port of Astoria, Pier 2.	Boat access only.	Waterfowl & shorebirds, wetland habitat, juvenile salmonids.
LCR-7.4	No field visit/ test	Chinook Point (WA) PAC0568 46°-16.853'N 124°-02.719'W	Deflection - Protect shoreline.	Low flow	500'	Deflect away from Fort Columbia State Park shoreline.	Fort Columbia State Park.	Fort Columbia State Park.	Fort Columbia State Park; recreational shoreline.
LCR-7.5	Field test 1/94; Field visit 2/97	Swash Lake (OR) 46°-12.652'N 123°-58.337'W	Exclusion - Keep oil out of lake.	Any flow	600'	Close off inlet to lake - access by land from Warrenton.	Port of Astoria, Pier 2.	By vehicle from the Fort Stevens State Park service road.	Waterfowl & shorebirds, wetland habitat.
LCR-10.1	Field test 1/94; Field visit 2/97	Tansy Point (OR) 46°-11.484'N 123°-55.342'W	Deflection / Collection - Prevent oil from getting further into Youngs Bay.	Low flow	400'	Angle into current to deflect oil to collection point (tend booms w/boat). Will work with a NW wind and a flood tide.	Warrenton	Boat access and by land at wood chipping company (need permission of company).	
LCR-10.8	Field test 1/94; Field visit 2/97	Inner Skipanon Waterway (OR) 46°-10.790'N 123°-54.480'W	Exclusion - Keep oil out of inner waterway.	Low flow	800'	Deploy boom further up waterway. Strategy will work well with a NW wind and a flood tide.	Marina approximately 2 miles upriver.	Marina approximately 2 miles upriver / access via sandy spit collection points.	Salmon concentrations and habitat.

## 4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-10.9	Field test 1/94; Field visit 2/97	Outer Skipanon Waterway (OR) 46°-10.953'N 123°-54.323'W	Deflection/Collection - Deflect oil into waterway for collection.	Low flow	300'	Angle boom into current to deflect oil to collection point on S. shoreline at sandy beach (tend boom w/tug). Strategy will work well with a NW wind and a flood tide.	Marina approximately 2 miles upriver.	Marina approximately 2 miles upriver / access via sandy spit collection points.	Salmon concentrations and habitat.
LCR-12.3	Field test 1/94; Field visit 2/97	Green Slough (OR) 46°-08.035'N 123°-52.342'W	Exclusion - Keep oil out of river.	Low flow	300'	Deploy boom across the entrance to the slough as a backup to the Lewis and Clark River strategy.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point.	Wintering waterfowl, Fort Clatsop National Park, foraging shorebirds and seabirds.
LCR-12.6	Field test 1/94; Field visit 2/97	Barrett Slough (OR) 46°-08.231'N 123°-51.996'W	Exclusion - Keep oil out of river.	Low flow	300'	Deploy boom across the entrance to the slough as a backup to the Lewis and Clark River strategy.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point.	Wintering waterfowl, Fort Clatsop National Park, foraging shorebirds and seabirds.
LCR-12.9	Field test 1/94; Field visit 2/97	Jeffers Slough (OR) 46°-08.658'N 123°-51.717'W	Exclusion - Keep oil out of river.	Low flow	300'	Deploy boom across the entrance to the slough as a backup to the Lewis and Clark River strategy.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point.	Wintering waterfowl, Fort Clatsop National Park, foraging shorebirds and seabirds.
LCR-13.0	Field test 1/94; Field visit 2/97	Lewis and Clark River (OR) 46°-09.163'N 123°-51.606'W	Exclusion - Keep oil out of river.	Low flow	1200'	Deploy boom at an angle from the west end of the bridge to the south and east for collection on the east shoreline. This is a working channel so leave boom open until oil seen & put out notice to mariners.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point.	Wintering waterfowl, Fort Clatsop National Park, foraging shorebirds and seabirds.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-14.1	Field test 1/94; Field visit 2/97	Youngs River (OR) 46°-10.140'N 123°-50.200'W	Exclusion - Keep oil out of River.	Low flow	2000'	Deploy boom from each end of the bridge on Hwy alt 102 in a chevron configuration and collect at the apex with a skimmer. This strategy may be difficult or impossible to deploy if the current is too strong.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point.	Wild and hatchery Salmon (Clatsop County Fish Pens) Great Blue Heron rookery, marina fisheries, shorebird and seabird foraging area, sturgeon, sensitive nesting species, waterfowl and crustaceans.
LCR-14.3	Field test 1/94; Field visit 2/97	Youngs River Fish Pens (OR) 46°-10.275'N 123°-50.000'W	Exclusion - Keep oil out of Pens.	Any flow	1600'	Deploy boom in a double chevron configuration to surround each pen.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point	Salmon (Clatsop County Fish Pens)
LCR-14.4	Field test 1/94; Field visit 2/97	Cook Slough (OR) 46°-09.709'N 123°-49.784'W	Exclusion - Keep oil out of slough.	High flow	200'	Place boom across slough entrance. May be a tide gate, deploy boom if gate leaks or cannot be closed.	Port of Astoria, Pier 2.		Wetland habitat
LCR-14.6	Field test 1/94; Field visit 2/97	Youngs River at mouth of the Wallooskee River (OR) 46°-08.760'N 123°-48.780'W	Exclusion - Keep oil out of River.	Low flow	1400'	Deploy boom across the river just south of the mouth of the Wallooskee River.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point.	Wild and hatchery Salmon, Great Blue Heron rookery, marina fisheries, shorebird and seabird foraging area, sturgeon, sensitive nesting species, waterfowl and crustaceans.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-14.8	New strategy 3/03	Wallooskee River at bridge (OR) 46°-08.947'N 123°-47.822'W	Exclusion/ Collection - Keep oil out of river, collect at bridge.	Low flow	700'	Deploy boom across the river on the downstream side of the bridge at Highway 202 at an angle to collect on the north side.	Port of Astoria, Pier 2.	Access by boat from launch at Yacht Club near bridge or at Tides Point across from Daggett Point, vehicle access from Highway 202.	Wild and hatchery Salmon, Great Blue Heron rookery, marina fisheries, shorebird and seabird foraging area, sturgeon, sensitive nesting species, waterfowl and crustaceans.
LCR-17.7	New strategy 3/03	Tongue Point - ODFW Salmon Net Pens (OR) 46°-12.297'N 123°-45.697'W	Exclusion - Keep oil out of the net pens.	Any flow	2000'	Deploy boom around the net pens and pier at the north end of the USCG Station on Tongue Point.	Tongue Point USCG Station.	Access by boat or vehicle from the USGC Station.	ODFW salmon net pens.
LCR-17.8	Field test 4/96	John Day River (OR) 46°-10.857'N 123°-44.400'W	Exclusion - Keep oil out of river.	Any flow	800'	Deploy boom in a chevron configuration around the RR trestle so as not to interfere with swinging bridge. Railroad track is operational, could bring in railcar for oil storage.	Tongue Point USCG Station.	Access via boat or railcar.	Waterfowl, other sensitive nesting species, wetlands, year-round.
LCR-19.3	Field visit 4/94	Twilight Marsh (Eskeline Creek) (OR) 46°-10.230'N 123°-41.890'W	Exclusion - Keep oil out of marsh and creek	Any flow	100'	Deploy boom in front of the railroad trestle, located about 2.3 miles east of the John Day River. Lay sorbents around interior of marshy areas. Possible to pump oil onto a railcar.	Tongue Point USCG Station	Access via boat or railcar	Sensitive nesting species, year-round.
LCR-19.9	New strategy 3/03	Marys Creek (OR) 46°-10.395'N 123°-40.022'W	Exclusion - Keep oil out of creek	Any flow	200'	Deploy boom in front of the railroad trestle, at the mouth of the creek. Possible to pump oil onto a railcar.	Tongue Point USCG Station	Access via boat or railcar	Salmon concentrations and habitat.
LCR-20.0	New strategy 3/03	Bear Creek (OR) 46°-10.320'N 123°-39.855'W	Exclusion - Keep oil out of creek	Any flow	200'	Deploy boom in front of the railroad trestle, at the mouth of the creek. Possible to pump oil onto a railcar.	Tongue Point USCG Station	Access via boat or railcar	Salmon concentrations and habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-20.3	New strategy 3/03	Ferris Creek (OR) 46°-10.293'N 123°-39.253'W	Exclusion - Keep oil out of creek	Any flow	300'	Deploy boom in front of the railroad trestle, at the mouth of the creek. Possible to pump oil onto a railcar.	Tongue Point USCG Station	Access via boat or railcar	Salmon concentrations and habitat.
LCR-22.3	No field visit/test	Sission Creek Marsh (WA) WAH0004 46°-18.072'N 123°-43.400'W	Exclusion - Protect marsh of Brix Bay.	Any flow	500'	Close off creek mouth. Difficult to protect marsh at mouth due to low water. Possible to boom further upstream, but does not protect the desired habitat.	Tongue Point USCG Station.	Boat access only.	Jan-Aug sensitive nesting species.
LCR-22.4	Field visit 4/94	Deep River (WA) WAH0006 46°-18.740'N 123°-42.833'W	Exclusion - Keep oil out of river.	Any flow	600'	Deploy boom at angle across mouth of river to road on west side for possible collection - pilings slightly upriver (500'), will not be able to protect marsh near mouth.	Tongue Point USCG Station, or from boat launch parking lot.	Boat launch = Hwy 4 E., turn right on Oneida Rd just before Deep River bridge, 2.1 miles to launch. Harry Larson has key to launch (1st house on right on way out from launch).	Salmonid concentrations and habitat (peak numbers in Feb-July, and Sept-Dec).
LCR-23.6	Field visit 4/94	Crooked Creek (WA) WAH0011 46°-17.790'N 123°-40.567'W	Exclusion - Keep oil out of creek and wetlands.	Any flow	200'	Deploy boom across the creek mouth at the bridge. Only winds from the SW would drive oil into the creek mouth.	Hwy 4 E., right on Altoona - Pillar Rock Rd. (403), take a right just before bridge for boat launch and parking lot.	Road access on Altoona - Pillar Rock Rd (403): take to where it crosses Crooked Creek. Grays Bay is too shallow for access from Columbia River.	Salmonid concentrations and habitat; wetlands.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-24.1	Field visit 4/94	Grays River (WA) WAH0009 46°-18.540'N 123°-40.300'W	Exclusion - Prevent oil from entering river.	Any flow	500'	Deploy boom at an angle across the river near Oneida or at the bend of Devils Elbow, depending on access. Minimize disturbance of shoreline and back-beach areas. Use established roads only for vehicle access.	Hwy 4 E., right on Altoona - Pillar Rock Rd. take a right just before bridge for boat launch and parking lot.	Boat launch on Grays river, too shallow to come in from Grays Bay.	Sensitive shoreline and back-beach, salmonid concentrations and habitat (peak numbers in Feb-July, and Sept-Dec).
LCR-24.5	Field test 1/94	Miller Sands Island and Lagoon (OR) 46°-14.910'N 123°-38.440'W	Deflection - Protect lagoon and island.	Low flow	1000'	Angle off piling at E. end of island to deflect oil into main channel. Sand bar east of Miller Sands Island makes lagoon inaccessible. Other than the main channel, the water around Island is very shallow.	Tongue Point USCG Station.	Tongue Point USCG Station.	Lagoon - high primary productivity, juvenile fish foraging, waterfowl concentration, sensitive nesting species, goose brooding, year-round.
LCR-26.4	Field test 2/97	Karlson Island (OR) 46°-12.333'N 123°-36.915'W	Exclusion - Protect wetlands behind dike, south of Karlson Island.	Any flow	400'	Deploy boom across breach in dike.	Tongue Point USCG Station or old ferry dock at Knappa.	Access from water only.	Freshwater marsh, waterfowl concentration, sensitive nesting area (F,W, Spr). Highly vegetated underwater with high tides.
LCR-27.2	Field visit 2/97	Big Creek (OR) 46°-11.090'N 123°-35.695'W	Exclusion - Keep oil out of creek.	Any flow	200'	Close off mouth of creek. Good structured sides along either bank.	Tongue Point USCG Station or old ferry dock at Knappa.	Access from water, or road access from town of Knappa.	Salmonid concentrations and habitat, wetlands. Protection required year-round.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-27.5	Field visit 2/97	Warren Slough (OR) 46°-11.340'N 123°-35.220'W	Exclusion - Keep oil out of slough.	Any flow	500'	Close off entrance to slough. Requires shallow draft skiff.	Knappa or Svensen.	Boat ramp at Aldridge Pt. or old ferry dock near Knappa. Road access off Hwy 30 via Waterhouse Rd.	Sensitive wetland area.
LCR-27.9	Field test 2/97	Grizzly Slough (OR) 46°-12.224'N 123°-33.915'W	Exclusion - Keep oil out of slough.	Any flow	400'	Close off entrance to slough. Requires shallow draft skiff. Grizzly Slough is up Blind Slough which is too large to boom off. Anchor to trees on either side.	Knappa or Svensen.	Boat ramp at Aldridge Pt. or old ferry dock near Knappa. Road access off Hwy 30 via Waterhouse Rd.	Sensitive wetland area.
LCR-29.2	Field visit 2/97	Gnat Creek (OR) 46°-11.962'N 123°-31.918'W	Exclusion - Keep oil out of Gnat Creek.	Any flow	200'	Close off entrance to Gnat Creek. Requires shallow draft skiff. Gnat Creek is up Blind Slough which is too large to boom off. Anchor to trees on either side.	Knappa or Svensen.	Boat ramp at Aldridge Pt. or old ferry dock near Knappa. Road access off Hwy 30 via Waterhouse Rd.	Sensitive wetland area.
LCR-33.2	Field test 1/94	Welch Island sloughs (OR) 46°-15.385'N 123°-29.088'W	Exclusion - Keep oil out of sloughs	Any flow	400'	Deploy boom across the entrance to the slough on the northwest corner of Welch Island.	USFWS refuge warehouse and dock on Tenasillahe Island.	Boat access only.	Lewis and Clark National Wildlife Refuge, sensitive wetland habitat.
LCR-33.3	Field test 1/94	Welch Island sloughs (OR) 46°-15.215'N 123°-29.020'W	Exclusion - Keep oil out of sloughs.	Any flow	500'	Deploy boom across the west entrance of the slough that runs through the middle of Welch Island.	USFWS refuge warehouse and dock on Tenasillahe Island.	Boat access only.	Lewis and Clark National Wildlife Refuge, sensitive wetland habitat.



4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-33.5	Field test 1/94	Skamokawa Creek and Brooks Slough (WA) WAH0058 46°-16.133'N 123°-27.307'W	Exclusion - Keep oil out of creek & slough.	Any flow	400'	Deploy boom across the mouth just before the junction of the creek and slough in a chevron configuration, from the seawall on the E. side to the pilling on the W. side. Use if oil is diverted into Steamboat Slough (LCR-35.1). Watch for boat traffic.	Skamokawa and/or Cathlamet.	Boat ramp at Skamokawa Vista Park.	Anadromous fish spawning stream.
LCT-33.7	Field test 1/94	Steamboat Slough - west end (oil moving upstream) (WA) WAH0059 46°-15.955'N 123°-27.233'W	Diversion / Collection - Divert oil out of main channel to collection point in Steamboat Slough.	Low flow	1,200'	If oil is moving upstream: angle 500' of boom from the W. end of Price Island to deflect oil inside slough. Deploy 700' of boom from the W. end of Price Island to the opposite shore for collection.	Skamokawa and/or Cathlamet.	Steamboat Slough road comes next to water for possible vac truck oil recovery - slough has N & S water access.	Shrub/scrub on the N. & S. side dike, S. side additionally emergent wetlands, sensitive nesting species. N. side includes deer habitat.
LCR-34.4	Field test 1/94	NW entrance to Red Slough between Welch and Tenasillahe Islands (OR) 46°-14.467'N 123°-28.655'W	Exclusion - Keep oil out of slough.	Any flow	800'	Deploy boom across the NW entrance to Red Slough. Close tide gates, contact USFWS through Wahkiakum County Sheriff.	USFWS Refuge warehouse and dock on Tenasillahe Island side of slough.	Boat access only.	Emergent wetlands throughout slough.
LCR-34.6	Field test 1/94	Welch Island sloughs (OR) 46°-14.907'N 123°-27.472'W	Exclusion - Keep oil out of sloughs.	Any flow	500'	Deploy boom across the east entrance of the slough that runs through the middle of Welch Island.	USFWS refuge warehouse and dock on Tenasillahe Island.	Boat access only.	Lewis and Clark National Wildlife Refuge, sensitive wetland habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-34.7	Field test 1/94	SW entrance to Red Slough between Welch and Tenasillahe Islands (OR) 46°-14.132'N 123°-28.570'W	Exclusion - Keep oil out of slough.	Any flow	600'	Deploy boom across the SW entrance to Red Slough. Close tide gates, contact USFWS through Wahkiakum County Sheriff.	USFWS Refuge warehouse and dock on Tenasillahe Island side of slough.	Boat access only.	Emergent wetlands throughout slough.
LCR-35.0	Field test 1/94	East entrance to Red Slough between Welch and Tenasillahe Islands (OR) 46°-14.593'N 123°-27.107'W	Exclusion - Keep oil out of slough.	Any flow	800'	Deploy boom across the East entrance to Red Slough. Close tide gates, contact USFWS through Wahkiakum County Sheriff.	USFWS Refuge warehouse and dock on Tenasillahe Island side of slough.	Boat access only.	Emergent wetlands throughout slough.
LCR-35.1	Field test 1/94, and 3/01.	Steamboat Slough - east end (oil moving downstream) (WA) WAH0064 46°-14.093'N 123°-26.127'W	Diversion / Collection - Divert oil out of main channel to collection point in Steamboat Slough.	Low flow	1,200'	If the oil moving downstream: angle 500' of boom from the E. end of Price Island to deflect oil inside the slough. Deploy 700' of boom from the E. end of Price Island to the opposite shore next to Steamboat Slough Road for collection with a vac truck.	Skamokawa and/or Cathlamet.	Steamboat Slough road comes next to water for possible vac truck oil recovery - slough has N & S water access.	Shrub/scrub on the N. & S. side dike, S. side additionally emergent wetlands, houseboats, sensitive nesting species. N. side includes deer habitat.
LCR-36.0	Field test 1/94	Elochoman Slough - north entrance (WA) WAH0067 46°-14.370'N 123°-25.150'W	Deflection/ Exclusion - Protect entrance to slough.	Any flow	500'	Deploy boom across north entrance to slough. Relatively slow current (1-1.5 knots) in slough.	USFWS barn just north of site. Cathlamet Marina offers fuel and food.	Vehicle and vac truck access from Steamboat Island Road. Boat ramp at Cathlamet marina.	Shrub/Scrub on both shores, wetland habitat, Columbia Whitetail deer habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-37.0	Field test 1/94	Elochoman River (WA) 46°-13.610'N 123°-23.995'W	Deflection/ Exclusion - Keep oil out of river.	Any flow	500'	Boom across mouth of river to protect wetlands from oil deflected into slough due to strategy LCR-38.0. Relatively slow current (1-1.5 knots) in slough.	USFWS barn just north of site. Cathlamet Marina offers fuel and food.	Vehicle and vac truck access from Steamboat Island Road. Boat ramp at Cathlamet marina.	Wetland habitat.
LCR-37.2	Field test 1/94	Elochoman Slough - middle entrance (WA) WAH0071 46°-13.272'N 123°-24.810'W	Deflection/ Exclusion - Protect entrance to slough.	Any flow	800'	Deploy boom across the middle entrance to the slough. Relatively slow current (1-1.5 knots) in slough. Log rafts may be present in this area.	USFWS barn just north of site. Cathlamet Marina offers fuel and food.	From gravel pit and lumber yard, can run vac truck down to water. Boat ramp at Cathlamet marina.	Shrub/Scrub on both shores, wetland habitat, Columbia Whitetail deer habitat.
LCR-37.7	Field test 4/97	Clifton Channel (OR) 46°-13.145'N 123°-27.735'W	Deflection/ Collection - Prevent oil from continuing downstream.	Any flow	500'	Deploy boom from the SW shore of Tenasillahe Island for collection of oil that enters the channel; poor access requires portable skimmers. Boom needs to be tended, current is 2-4 knots, strong winds. Log rafts may be present in this area.	USFWS barn just north of site. Cathlamet Marina offers fuel and food.	Boat access only. Boat ramp at Westport Slough or at Cathlamet, private ramp at Aldridge Pt.	Emergent wetlands. Downriver is extremely sensitive from this point.
LCR-37.9	Field test 1/94	Elochoman Slough - south entrance (WA) WAH0082 46°-12.450'N 123°-23.293'W	Deflection/ Collection - Deflect oil to the east shore at the Cathlamet Marina breakwater for collection.	Any flow	1000'	Deploy a doubled boom at an angle to collect oil from the breakwater at the Cathlamet Marina. Relatively slow current (1-1.5 knots) in slough. Log rafts may be present in this area.	Cathlamet Marina.	Vehicle access from the road on the breakwater. Boat ramp at the Cathlamet marina.	Shrub/Scrub on both shores. Columbia Whitetail deer habitat.
LCR-38.0	Field test 1/94	Elochoman Slough - south entrance (WA) WAH0082 46°-12.374'N 123°-23.390'W	Deflection - Deflect oil into slough entrance for collection at LCR-37.9.	Any flow	500'	Deploy boom from the S.end of the island to deflect oil inside the slough for collection at LCR-37.9.	Cathlamet Marina.	Vehicle access from the road on the breakwater. Boat ramp at the Cathlamet marina.	Shrub/Scrub on both shores. Columbia Whitetail deer habitat.

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Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-38.2	Field test 4/97	Clifton Channel (OR) 46°-12.720'N 123°-27.735'W	Deflection/ Collection - Prevent oil from continuing downstream.	Any flow	500'	Deploy boom from Clifton for collection of oil that enters the channel. Boom needs to be tended, current is 2-4 knots, strong winds. Log rafts may be present in this area.	Clifton or Cathlamet.	Vehicle access at Clifton. Railroad access along bank. Boat ramp at Westport Slough or at Cathlamet, private ramp at Aldridge Pt.	Emergent wetlands. Downriver is extremely sensitive from this point.
LCR-38.5	Field test 4/97, and 3/01.	Clifton Channel - north side entrance (OR) 46°-12.209'N 123°-25.983'W	Diversion - Deflect oil away from Clifton Channel/ sensitive shoreline.	Any flow	1000'	Deploy boom along the row of pilings at the south end of Tenasillahe Island. Boom may need to be tended, current is 2-4 knots, strong winds. Log rafts may be present in this area.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet, private ramp at Aldridge Pt.	Emergent wetlands. Downriver is extremely sensitive from this point.
LCR-38.8	Field test 4/97, and 3/01.	Clifton Channel - south side entrance (OR) 46°-11.910'N 123°-26.128'W	Diversion - Deflect oil away from Clifton Channel/ sensitive shoreline.	Any flow	500'	Deploy boom from the shore at Bradwood to deflect oil into the main channel. Boom needs to be tended, current is 2-4 knots, strong winds. Log rafts may be present in this area.	Cathlamet	Vehicle access difficult. Railroad access along bank. Boat ramp at Westport Slough or at Cathlamet, private ramp at Aldridge Pt.	Emergent wetlands. Downriver is extremely sensitive from this point.
LCR-40.5	Field test 1/94	Puget Island/ Bernie Slough - west end (WA) WAH0150 46°-11.547'N 123°-23.767'W	Exclusion - Protect inner sloughs.	Any flow	400'	Deploy boom across the west entrance of Bernie Slough, from Puget Island to Little Island.	Cathlamet	Vehicle access from roads on Puget Island or Little Island. Boat ramp at Westport Slough or at Cathlamet.	Great blue heron rookery, waterfowl use in winter.
LCR-41.1	Field test 3/97	Puget Island/ Welcome Slough (WA) WAH0107 46°-10.395'N 123°-24.230'W	Exclusion - Keep oil out of slough.	Any flow	300'	Deploy boom across the slough entrance.	Cathlamet	Possible vehicle access from private property. Boat ramp at Westport Slough or at Cathlamet.	Wetland habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-41.6	Field test 3/97	Wauna (OR) 46°-09.670'N 123°-24.387'W	Deflection/ Collection.	Low flow	1,000'	Deploy two 500' booms in parallel, angled upstream; collect with skimmers/ vac trucks.	James River mill.	Boat ramp at Westport Slough or at Cathlamet.	Down-stream resources.
LCR-42.4	Field visit 3/97	Puget Island/ Bernie Slough - east end (WA) WAH0160 46°-10.420'N 123°-21.435'W	Exclusion - Protect inner sloughs.	Any flow	200'	Deploy boom across the east entrance of Bernie Slough, from Puget Island to Little Island.	Cathlamet	Possible vehicle access from private property. Boat ramp at Westport Slough or at Cathlamet.	Great blue heron rookery, waterfowl use in winter.
LCR-42.5	Field test 3/97	Driscoll Slough (OR) 46°-09.100'N 123°-23.745'W	Exclusion.	Any flow	300'	Deploy boom across the slough entrance.	James River mill.	Vehicle access from the mill. Boat ramp at Westport Slough or at Cathlamet.	Wetlands habitat.
LCR-43.2	Field test 3/97	Westport Slough (OR) 46°-08.228'N 123°-22.633'W	Exclusion/ Collection - Keep oil out of slough, collect at the boat ramp.	Any flow	700'	If the ferry is shut down, deploy boom just behind daymarker 58 over to pilings or trees on the west bank, diverting oil into the slough for collection. If necessary to keep the ferry running, move the boom site inside the slough past the ferry dock and protect the unnamed stream west of the ferry dock. Ferry traffic is a big issue.		US 30 to ferry dock.	Salmonid concentrations and habitat (peak concentrations during Aug - Oct).
LCR-44.3	Field visit 3/97	Puget Island/ East end sloughs west entrance (WA) WAH0124 46°-09.062'N 123°-21.302'W	Exclusion - Keep oil out of sloughs.	Any flow	300'	Deploy boom across the west entrance to the sloughs. Slough is named "Net Rack Slough" on the USGS quad map. When the river is low, booming may not be necessary or feasible.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Wetland habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-45.0	Field visit 3/97	Puget Island/ East end sloughs outer east entrance (WA) WAH0133 46°-09.890'N 123°-20.428'W	Exclusion - Keep oil out of sloughs.	Any flow	200'	Deploy boom across the outer east entrance to the sloughs. Boom between Jackson Island and Whites Island. When the river is low, booming may not be necessary or feasible.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Wetland habitat.
LCR-45.2	Field visit 3/97	Puget Island/ East end sloughs inner east entrance (WA) WAH0132 46°-09.734'N 123°-20.295'W	Exclusion - Keep oil out of sloughs.	Any flow	200'	Deploy boom across the inner east entrance to the sloughs. Slough is named "Cut Off Slough" on the USGS quad map, and separates Puget Island from Whites Island; boom across north entrance. When the river is low, booming may not be necessary or feasible.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Wetland habitat.
LCR-45.6	Field visit 3/97	Puget Island/ East end sloughs middle entrance (WA) WAH0127 46°-09.040'N 123°-19.920'W	Exclusion - Keep oil out of sloughs.	Any flow	300'	Deploy boom across the middle entrance to the sloughs. Slough is named "Cut Off Slough" on the USGS quad map, and separates Puget Island from Whites Island; boom across the south entrance. When the river is low, booming may not be necessary or feasible.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Wetland habitat.
LRC-48.1	New strategy 3/03	Wallace Island /Slough - northwest end (OR) 46°-08.455'N 123°-16.472'W	Exclusion - Keep oil out of sloughs	Any flow	500'	Deploy boom across the north entrance to the channel on the west end of Wallace Island. Water depth is likely to be very shallow. When the river is low, booming may not be necessary or feasible. Strong currents may prevent effective booming.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Waterfowl and Columbian whitetail deer

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-48.6	Field test 1/94	Wallace Island /Slough - southwest end (OR) 46°-08.262'N 123°-15.806'W	Exclusion - Keep oil out of sloughs.	Any flow	500'	Deploy boom across the entrance to the channel on the southwest end of Wallace Island. Water depth is likely to be very shallow.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Waterfowl and Columbian whitetail deer
LCR-48.8	Field test 1/94	Wallace Island /Slough - south center (OR) 46°-08.243'N 123°-15.019'W	Exclusion - Keep oil out of sloughs.	Any flow	500'	Deploy boom across the south entrance to the center channel on Wallace Island. Water depth is likely to be very shallow.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Waterfowl and Columbian whitetail deer.
LCR-49.1	Field test 1/94	Wallace Island /Slough - north center (OR) 46°-08.568'N 123°-14.948'W	Exclusion - Keep oil out of sloughs.	Any flow	500'	Deploy boom across the north entrance to the center channel on Wallace Island. Water depth is likely to be very shallow.	Cathlamet	Boat access only. Boat ramp at Westport Slough or at Cathlamet.	Waterfowl and Columbian whitetail deer.
LCR-49.6	Field test 1/94	Beaver Slough / Clatskanie River west side (OR) 46°-08.349'N 123°-13.908'W	Diversion/ Collection - Divert oil into river mouth/ slough for collection.	Any flow	500'	Deploy boom from the point on the west side of the Clatskanie River mouth, angled into main channel of the Columbia River to divert oil into the river mouth/ slough for collection.	Cathlamet or Longview.	Boat access from Cathlamet, Westport Slough, or Longview. Vehicle access from Highway 30 to Point Adams Road.	Salmonid concentrations and habitat; wetlands.
LCR-49.7	Field test 1/94	Beaver Slough / Clatskanie River east side (OR) 46°-08.316'N 123°-13.726'W	Collection/ Exclusion - Collect oil and prevent oil from entering the inner slough/river.	Any flow	500'	Deploy boom across the Clatskanie River inside the mouth to collect oil and prevent oil from entering the slough and moving up the river.	Cathlamet or Longview.	Boat access from Cathlamet, Westport Slough, or Longview. Vehicle access from Highway 30 to Point Adams Road.	Salmonid concentrations and habitat; wetlands.

## 4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-53.8	New strategy 3/03	Mill Creek Slough (WA) 46°-11.335'N 123°-10.585'W	Collection - Prevent oil from moving downstream.	Any flow	500'	Deploy boom at an angle from the point on the west side (downstream) of the mouth of Mill Creek, upstream and towards the middle of the river to collect oil moving along the Washington shore. Direct oil into the mouth of Mill Creek for collection with a vac truck on the west side of the creek. Strong currents, particularly during outgoing tides, may prevent effective collection.	Stage from the large gravel parking area on the west side of the creek and north side of the highway.	Vehicle access from Highway 4 to parking area on west side of creek. Boat access from Ramp at Willow Grove Park.	Downstream resources.
LCR-53.9	New strategy 3/03	Mill Creek Slough (WA) 46°-11.335'N 123°-10.560'W	Exclusion - Keep oil out of Mill Creek.	Any flow	200'	Deploy boom across the mouth of Mill Creek upstream of the bridge on Highway 4 to prevent oil from moving up the creek and to direct oil to the west side for collection.	Stage from the large gravel parking area on the west side of the creek and north side of the highway.	Vehicle access from Highway 4 to parking area on west side of creek. Boat access from Ramp at Willow Grove Park.	Creek habitat.
LCR-54.2	Field test 3/97, visit 6/03	Abernathy Creek (WA) 46°-11.484'N 123°-10.086'W	Exclusion - Prevent oil from entering creek.	Any flow	400'	Boom off mouth of creek. Minimize disturbance of shoreline and back-beach areas around creek mouth. Use established roads only for vehicle access.	Stage from County Line Park.	Strategy can be deployed from land, but may be easier from a boat.	Sensitive shoreline and back-beach, Sept - May - most crucial to protect salmonid concentrations and habitat.
LCR-54.4	Field test 1/94	Gull/ Crims Islands - west opening (OR) 46°-11.050'N 123°-09.494'W	Exclusion - Protect backwaters behind Gull Island.	Low flow	500'	Deploy boom across the west opening between Gull Island and Crims Island.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.



4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-55.4	New strategy 3/03	John Slough (OR) 46°-10.164'N 123°-08.709'W	Exclusion - Prevent oil from entering slough.	Any flow	300'	Deploy boom across the entrance to the slough.	Stage from Kallunki Road at site.	Vehicle access from Kallunki Road near Locoda. May be easier to deploy from a boat.	Wetland habitat.
LCR-55.5	Field test 1/94	Gull/Crims Islands - east opening (OR) 46°-10.952'N 123°-08.475'W	Exclusion - Protect backwaters behind Gull Island.	Low flow	500'	Deploy boom across the east opening between Gull Island and Crims Island.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.
LCR-55.6	Field test 1/94	Crims Island (OR) 46°-10.311'N 123°-08.464'W	Exclusion - Keep oil out of marsh area.	Any flow	300'	Place boom across opening to extensive marsh area on the south side of Crims Island.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat
LCR-55.7	Field test 3/97, visit 6/03	Germany Creek (WA) 46°-11.388'N 123°-07.536'W	Exclusion - Prevent oil from entering creek.	Any flow	200'	Deploy boom across the creek mouth.	Stage from the Willow Grove County Park.	Strategy can be deployed from land, but may be easier from a boat.	Sept - May - most crucial to protect salmonid concentrations and habitat.
LCR-55.9	Field test 3/97	Coal Creek Slough (WA) 46°-11.387'N 123°-06.932'W	Exclusion - Keep oil out of Coal Creek Slough.	Any flow	500'	Deploy boom across the mouth of Coal Creek Slough. Note - special attention needed for boom tending due to regular boat traffic in area.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.
LCR-58.7	Field test 1/94	Fisher Island/Hump Island (WA) 46°-10.180'N 123°-04.515'W	Exclusion - Keep oil out of the slough between Fisher Island and Hump Island.	Any flow	1,000'	Deploy boom across the entrance to the slough between Fisher Island and Hump Island. Deploy at high tide only.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.

## 4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-58.8	Field test 1/94	Fisher Island Slough - west end (WA) 46°-10.335'N 123°-04.245'W	Deflection/ Collection - Prevent oil from moving into the slough from the west end.	Low flow	500'	Deploy boom from the north shore out to the anchor buoy whenever strong westerly wind could push oil upstream into the slough.	Stage from the Willow Grove County Park.	Vehicle access from Willow Grove Road. Boat access from the Ramp at Willow Grove Park.	Wetland/ backwater habitat.
LCR-58.9	Field test 1/94	Fisher Island - west end (WA) 46°-10.235'N 123°-04.278'W	Exclusion - Keep oil out of the marsh area.	Any flow	500'	Deploy boom in front of the marsh area on the west end of Fisher Island, particularly if there is a strong westerly wind.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.
LCR-59.0	Field test 1/94	Fisher Island Slough - west end (WA) 46°-10.350'N 123°-04.090'W	Deflection/ Collection - Prevent oil from moving downstream.	Low flow	900'	Natural collection area - angle 3 parallel 300' sections of boom to deflect oil toward shore, where it can be collected with vac trucks/ skimmers.	Stage from the Willow Grove County Park.	Vehicle access from Willow Grove Road. Boat access from the Ramp at Willow Grove Park.	Protect downriver resources.
LCR-59.8	Modified strategy 3/03	Walker Island (OR) 46°-10.200'N 123°-03.966'W	Collection - Prevent oil from moving up channel behind island.	Low flow	500'	Deploy boom from the Oregon shore west of the down stream end of Walker Island to prevent oil from moving up behind the island when there is a strong westerly wind. Collect with a shallow water barge.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.
LCR-60.2	Field test 1/94	Fisher Island - east end (WA) 46°-10.182'N 123°-02.895'W	Exclusion - Keep oil out of the marsh area.	Any flow	1000'	Deploy boom in front of marsh area to protect marsh from oil deflected into Fisher Island Slough.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Wetland habitat.
LCR-60.4	Field test 1/94	Fisher Island Slough - east end (WA) 46°-09.935'N 123°-02.710'W	Deflection/ Collection - Prevent oil from moving into slough.	Any flow	500'	Natural collection area - deploy boom from mainland shore to the anchor buoy in mid-channel to deflect oil toward shore, where it can be collected with vac trucks/ skimmers.	Stage from the Willow Grove County Park.	Vehicle access from Willow Grove Road. Boat access from the Ramp at Willow Grove Park.	Protect downriver and wetland resources.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-64.0	Field visit; date unknown	Lord Island - east end (OR) 46°-07.310'N 122°-59.890'W	Exclusion - Prevent oil from moving through the channel between Lord Island and Slaughters Dike.	Low flow	1,400'	Deploy boom across the opening between Lord Island and Slaughters Dike.	Stage from the Willow Grove County Park.	Boat access only. Ramp at Willow Grove Park.	Waterfowl use area, wetland habitat.
LCR-66.2	Field visit; date unknown	Port of Longview (WA) 46°-06.435'N 122°-57.378'W	Collection - Prevent oil from moving down stream.	Low flow	3,000'	Deploy 1,000' lengths of boom from the Port of Longview to contain/collect oil under docks. May need tug to assist in deployment. This is a major natural collection site, and the last good chance to prevent oil from moving down stream. <i>Note - Longview Fibre has developed a number of additional strategies in this vicinity to address the unique hazards of a toluene spill; consult their response plan for more information.</i>	Port of Longview.	Vehicle access from Longview to the port docks. Boat access from the Ramp at Willow Grove Park or Rainier.	Downstream resources.
LCR-70.0	Field visit; date unknown	Cottonwood Island - east side slough (WA) 46°-04.915'N 122°-52.540'W	Exclusion - Keep oil out of slough.	Any flow	500'	Close off mouth to the slough on east side of Cottonwood Island.	Stage from the Willow Grove County Park or Kalama.	Boat access only. Use ramp at Willow Grove Park, or steep pay boat ramp at Kalama.	Wetland habitat.
LCR-71.4	No field visit/ test	Carrol's Channel south end (WA) 46°-03.510'N 122°-52.040'W	Exclusion - Keep oil out of small inlet at the south end of the channel (east side).	Any flow	1000'	Close off mouth of the small inlet at the south end of Carrol's Channel (on the east side).	Stage from the Willow Grove County Park or Kalama.	Boat access only. Use ramp at Willow Grove Park, or steep pay boat ramp at Kalama.	Wetland habitat.

## 4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-71.5	New strategy 3/03	Carrol's Channel south end (WA) 46°-03.365'N 122°-52.333'W	Collection/ Exclusion - Natural collection area, prevent oil from moving up the channel.	Any flow	1200'	Deploy boom across the south end of Carrol's Channel to direct collected oil to the east shore, and to prevent oil from moving through Carrol's Channel. Current may be too strong to deploy boom across channel. If so, deploy as much boom as possible to divert oil to the east shore for collection.	Stage from the Willow Grove County Park or Kalama.	Vehicle access from east shore. Boat access from ramp at Willow Grove Park, or steep pay boat ramp at Kalama.	Wetland habitat.
LCR-71.6	New strategy 3/03	Carrol's Channel south end (WA) 46°-03.345'N 122°-52.540'W	Collection - Enhance natural collection into south end of Carrol's Channel.	Low flow	500'	Deploy boom from the south end of Cottonwood Island to enhance natural collection.	Stage from the Willow Grove County Park or Kalama.	Boat access only. Use ramp at Willow Grove Park, or steep pay boat ramp at Kalama.	Wetland habitat.
LCR-73.7	No field visit/ test	Goble Creek (OR) 46°-01.250'N 122°-52.522'W	Exclusion - Keep oil out of the creek.	Any flow	100'	Deploy boom across creek mouth.	Stage from the Willow Grove County Park or Kalama.	Possible vehicle access from Highway 30. Boat access from ramp at Willow Grove Park, or steep pay boat ramp at Kalama.	Salmonid concentrations and habitat (peak times are Sep-Oct, Apr-May).
LCR-76.0	No field visit/ test	Tide Creek (OR) 45°-59.660'N 122°-51.920'W	Exclusion - Keep oil out of the slough and creek.	Any flow	1000'	Deploy boom across small slough at the creek mouth.	Stage from the Willow Grove County Park or Kalama.	Boat access only. Use ramp at Willow Grove Park, or steep pay boat ramp at Kalama.	Wetland habitat, salmonid concentrations and habitat (peak times are Sep-Oct, Apr-May).
LCR-79.5	No field visit/test	Martin Island - north end (WA) 45°-57.375'N 122°-47.985'W	Exclusion - Keep oil out of Martin Slough.	Any flow	600'	Deploy boom across the north end of Martin Slough.	Stage from St. Helens or Kalama.	Boat access only. Use ramp at St Helens, or steep pay boat ramp at Kalama.	Waterfowl (winter); geese (summer).

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-79.8	New strategy 3/03	Goat Island - north end (OR) 45°-56.945'N 122°-49.168'W	Exclusion - Keep oil out of slough behind Goat Island.	Any flow	600'	Deploy boom across the north end of the slough behind Goat Island.	Stage from St. Helens or Kalama.	Boat access only. Use ramp at St Helens, or steep pay boat ramp at Kalama.	Waterfowl (winter); geese (summer).
LCR-81.0	No field visit/test	Martin Island - south end (WA) 45°-56.065'N 122°-47.850'W	Exclusion - Keep oil out of Martin Slough.	Any flow	600'	Deploy boom across the south end of Martin Slough.	Stage from St. Helens or Kalama.	Boat access only. Use ramp at St Helens, or steep pay boat ramp at Kalama.	Waterfowl (winter); geese (summer).
LCR-81.2	No field visit/test	Burke Island - south end (WA) 45°-55.863'N 122°-47.823'W	Exclusion - Keep oil out of Burke Slough.	Any flow	300'	Deploy boom across the south end of Burke Slough.	Stage from St. Helens or Kalama.	Boat access only. Use ramp at St Helens, or steep pay boat ramp at Kalama.	Waterfowl (winter); geese (summer).
LCR-81.8	New strategy 3/03	Goat Island - south end (OR) 45°-55.518'N 122°-48.865'W	Exclusion - Keep oil out of slough behind Goat Island.	Any flow	500'	Deploy boom across the south end of the slough behind Goat Island.	Stage from St. Helens or Kalama.	Boat access only. Use ramp at St Helens, or steep pay boat ramp at Kalama.	Waterfowl (winter); geese (summer).
LCR-82.4	No field visit/test	Deer Island Slough (OR) 45°-54.860'N 122°-48.965'W	Exclusion - Keep oil out of slough.	Any flow	300'	Deploy boom across the mouth of the slough on the south end. Ensure tide gates are closed at each end.	Stage from St. Helens or Kalama.	Boat access only. Use ramp at St Helens, or steep pay boat ramp at Kalama.	Creek; freshwater clams; wetland habitat.
LCR-85.7	No field visit/test	Goerig Slough - collection (WA) 45°-52.400'N 122°-46.725'W	Collection - Prevent oil from moving down stream.	Low flow	1000'	Deploy boom from the southeast corner of the islands off Goerig Slough to the mainland shore for collection with a skimmer or vac truck.	Stage from St. Helens.	Possible vehicle access from Dike Road. Boat access from ramp at St Helens.	Downstream resources.
LCR-85.8	No field visit/test	Goerig Slough - diversion (WA) 45°-52.200'N 122°-46.905'W	Diversion - Prevent oil from moving down stream.	Low flow	700'	Deploy boom at an angle from the southwest corner of the islands off Goerig Slough, up-stream into the main channel of the river to divert oil into the area behind the islands for collection.	Stage from St. Helens.	Boat access only. Use ramp at St Helens.	Downstream resources.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-87.3	New strategy 3/03	Gee Creek (WA) 45°-50.895'N 122°-46.560'W	Exclusion - Keep oil out of the creek and slough upstream.	Any flow	100'	Deploy boom across the mouth of the creek. Will likely require a shallow-draft boat.	Stage from the Ridgefield Marina or St. Helens.	Boat access only. Use ramp at the Ridgefield Marina or St Helens.	Ridgefield National Wildlife Refuge. Wetlands habitat.
LCR-87.6	Field test 4/97	Ridgefield NWR/ Bachelor Island Slough - north entrance (WA) 45°-50.540'N 122°-46.685'W	Exclusion - Keep oil out of slough	Any flow	600'	Deploy boom across the down-river (north) end of Bachelor Island Slough. Note - oil may collect here naturally. Minimize disturbance of shoreline and back-beach areas. Use established roads only for vehicle access.	Stage from the Ridgefield Marina or St. Helens.	Boat access only. Use ramp at the Ridgefield Marina or St Helens.	Ridgefield National Wildlife Refuge. Waterfowl, sand hill crane wintering, great blue heron spring nesting, bald eagle nests, wetlands habitat. Sensitive shoreline and back-beach.
LCR-91.0	Field test 4/97	Ridgefield NWR/ Bachelor Island Slough - south entrance (WA) 45°-47.625'N 122°-46.385'W	Exclusion - Keep oil out of slough	Any flow	600'	Deploy boom across the up-river (south) end of Bachelor Island Slough. Note - oil may collect here naturally. <i>Contact the USFWS to have 3 input pumps shut off - pager, 360-971-6000.</i>	Stage from the Ridgefield Marina or St. Helens.	Boat access only. Use ramp at the Ridgefield Marina or St Helens.	Ridgefield National Wildlife Refuge. Waterfowl, sand hill crane wintering, great blue heron spring nesting, bald eagle nests, wetlands habitat. Sensitive shoreline and back-beach.
LCR-92.3	Field test 4/97	Campbell Lake (WA) 45°-46.972'N 122°-46.083'W	Exclusion - Keep oil out of the lake.	High flow	300'	Deploy boom across the entrance to Campbell Lake.	Stage from the Ridgefield Marina or St. Helens.	Boat access only. Use ramp at the Ridgefield Marina or St Helens.	Ridgefield National Wildlife Refuge. Sandhill crane roost area, waterfowl, wetlands habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-94.3	Field visit 6/03	Post Office Lake (WA) 45°-45.275'N 122°-45.303'W	Exclusion - Keep oil out of slough adjacent to lake.	High flow	200'	Deploy boom in a chevron configuration to enclose the entrance to the culvert that connects the river to the lake. The culvert entrance on the river side is a grated concrete structure about 20-30 feet from shore that is nearly flush with the river bottom. <i>The entrance on the lake side has stop-logs, contact the USFWS at 360-971-6000 (pager) to have someone install the stop-logs.</i>	Stage from the boat ramp at Caterpillar Island, the Ridgefield Marina or St. Helens.	Vehicle access from the Lower River Road. Boat access from the ramp at Caperpillar Island, the Ridgefield Marina or St Helens.	Ridgefield National Wildlife Refuge. Waterfowl, wetlands habitat.
LCR-94.5	No field visit/test	Willow Bar Islands (OR) 45°-45.140'N 122°-46.060'W	Exclusion or Collection - Keep oil out of slough behind Willow Bar Islands or use for collection.	Any flow	800'	Deploy boom in a chevron configuration by placing one section from the north tip of the primary Willow Bar Island to the small island to the north, and then continuing northwest to Sauvie Island. If no waterfowl are present in the slough, deploy 600' of boom to divert oil into the north end of the slough for collection; deploy 200' of boom across the slough to prevent oil from moving into the south end of the slough.	Stage from the boat ramp at Caterpillar Island, the Ridgefield Marina or St. Helens.	Vehicle access from Brown Road on Sauvie Island. Boat access from the ramp at Caperpillar Island, the Ridgefield Marina or St Helens.	Wetland habitat.
LCR-97.5	Field test 11/97	Caterpillar Island - north end (WA) 45°-42.565'N 122°-45.555'W	Exclusion - Keep oil out of slough behind island.	High flow	500'	Deploy boom from the north tip of Caterpillar Island to the mainland shore.	Stage from the boat ramp at Caterpillar Island.	Boat access only from ramps at Caperpillar Island, Vancouver, or Portland.	Wetland habitat.

4.3.2.1 Lower Columbia River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
LCR-98.6	Field test 11/97	Caterpillar Island - south end (WA) 45°-41.660'N 122°-45.815'W	Exclusion - Keep oil out of slough behind island.	High flow	500'	Deploy boom from the south tip of Caterpillar Island to the mainland shore.	Stage from the boat ramp at Caterpillar Island.	Boat access only from ramps at Caterpillar Island, Vancouver, or Portland.	Wetland habitat.
LCR-100.8	Field test 10/01	Vancouver Lake/Flushing Channel (WA) 45°-39.947'N 122°-45.528'W	Deflection/Collection - Deflect oil into Flushing Channel for collection.	Low flow	800'	Angle a 400' section SW into the river to deflect oil into a collection site in channel. Double boom channel with two 200' sections to protect Vancouver Lake. If necessary, valves can be closed at River Road to prevent oil from entering Vancouver Lake. This strategy is most effective with a south wind at slack water or when oil is moving along the north (east) shore. Sand bars at the mouth of the channel are dynamic and may require modification of the strategy.	Stage from Vancouver, Portland, or the parking area at the west end of the flushing channel.	Vehicle access from Lower River Road. Boat access from Vancouver or Portland.	Vancouver Lake; down river resources.
LCR-108.4	Field visit 9/94	Marine Park Boat Ramp - upriver from Ryan Point (WA) 45°-36.747'N 122°-38.022'W	Collection - Collect oil in small cove.	Low flow	500'	Angle boom off boat ramp into river; divert oil to collection site.	Stage from Vancouver, Portland, or the boat ramp parking area.	Marine Park Boat Ramp access via Marine Parkway; good command post area.	Down river resources.
LCR-109.6	Field visit 9/94	Wintler Park (WA) 45°-36.667'N 122°-36.652'W	Collection - Divert oil to collection sites.	Low flow	500'	Angle boom upstream, off point just down river of Wintler Park (note - may not need full 500').	Stage from Vancouver, Portland, or the boat ramp parking area.	Boat access from the ramp near Lieser Point. Vehicle access off of Highway 14.	Resources down river (may be osprey nests in the area).



4.3.2.2 Multnomah Channel Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
MC-1	Field test 11/97	Multnomah Channel - southern entrance, south shore 45°-37.120'N 122°-47.850'W	Deflection/ Collection - Prevent oil from moving up the channel.	Any flow	2,800'	Deploy 400' at south side of Multnomah Channel mouth, extending NE to pilings; deploy another parallel 400' slightly downstream. Deploy 2,000' toward NE, running from same pilings on south shore to dolphin on north shore to deflect oil toward MC-2. Note - during lower flow, can instead create collection chevron by angling 2,000' from mid-channel back to dolphin at north end of mouth.	Portland.		Waterfowl, eagle winter feeding area, shorebirds, cranes, Sturgeon Lake, sensitive marshes.
MC-2	Field test 11/97	Multnomah Channel - southern entrance, north shore 45°-37.340'N 122°-48.300'W	Collection - Prevent oil from moving up the channel.	Low flow	900'	Run 700' section from north shore to boom anchor buoy to collect oil deflected by MC-1; extend additional 200' into channel from buoy. Angle second 400' section parallel and slightly downstream for back-up.	Portland.	Via Fred's Marina off Highway 30. Access to Sauvie Island from Highway 30 to S. Island Rd.	Waterfowl, eagle wintering area, shorebirds, cranes, Sturgeon Lake, sensitive marshes.
MC-3a	Field test 2/97	Multnomah Channel - Sauvie Island bridge, west side 45°-37.705'N 122°-49.025'W	Collection - Prevent oil from moving up the channel.	Any flow	400'	Angle boom from the mainland to the bridge. Collect oil with portable skimmers.	Portland.	Via Fred's Marina off Highway 30. Access to Sauvie Island from Highway 30 to S. Island Rd.	Waterfowl, eagle winter feeding area, shorebirds, cranes, Sturgeon Lake, sensitive marshes.
MC-3b	Field test 2/97	Multnomah Channel - Sauvie Island bridge, east side 45°-37.765'N 122°-48.925'W	Collection - Prevent oil from moving up the channel.	Any flow	600'	Angle boom from Sauvie Island to the bridge. Collect oil with portable skimmers.	Portland.	Via Fred's Marina off Highway 30. Access to Sauvie Island from Highway 30 to S. Island Rd.	Waterfowl, eagle winter feeding area, shorebirds, cranes, Sturgeon Lake, sensitive marshes.

4.3.2.3 Willamette River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
WR-0.9	Field test 6/97	Columbia Slough (Smith & Bybee Lakes) 45°-38.608'N 122°-46.043'W	Deflection/ Collection - Deflect oil into collection area in slough; keep oil out of inner slough and lakes.	Any flow	1000'	Use 400' section to deflect oil into the entrance to Columbia Slough - place boom on N or S side of entrance depending on spill location and tide. Double boom the inside of entrance with 300' sections to prevent oil from moving into the inner slough and lakes.	Portland.	Via boat.	Critical wetland area.
WR-3.7	No field visit/ test	Willamette River 45°-36.720'N 122°-46.938'W	Collection - Prevent oil from moving into the Columbia River.	Any flow	500'	Angle boom from east shore to deflect/ collect oil moving toward the Columbia River. Will need to anchor ends in river or tend with a workboat.	Cathedral Park.	Boat ramp at Cathedral Park.	Lower Columbia River resources.
WR-4.3	No field visit/ test	Willamette River 45°-36.283'N 122°-46.695'W	Collection - Prevent oil from moving into the Columbia River.	Any flow	500'	Angle boom from east shore to deflect/ collect oil moving toward the Columbia River. Will need to anchor ends in river or tend with a workboat.	Cathedral Park.	Boat ramp at Cathedral Park.	Lower Columbia River resources.
WR-4.4	No field visit/ test	Willamette River 45°-36.227'N 122°-46.651'W	Collection - Prevent oil from moving into the Columbia River.	Any flow	500'	Angle boom from east shore to deflect/ collect oil moving toward the Columbia River. Will need to anchor ends in river or tend with a workboat.	Cathedral Park.	Boat ramp at Cathedral Park.	Lower Columbia River resources.
WR-4.5	No field visit/ test	Willamette River 45°-36.098'N 122°-46.562'W	Collection - Prevent oil from moving into the Columbia River.	Any flow	500'	Angle boom from east shore to deflect/ collect oil moving toward the Columbia River. Will need to anchor ends in river or tend with a workboat.	Cathedral Park.	Boat ramp at Cathedral Park.	Lower Columbia River resources.
WR-5.8	No field visit/ test	Willamette River - St. John's Bridge 45°-35.220'N 122°-45.725'W	Collection - Prevent oil from moving into the Columbia River.	Any flow	300'	Deploy boom from Cathedral Park to the St. John's Bridge to contain/ collect oil at the park.	Cathedral Park.	Boat ramp at Cathedral Park.	Lower Columbia River resources.

## 4.3.2.3 Willamette River Proposed Booming and Collection Strategies: Matrices

Strategy	Status	Location	Response Strategy	Flow Level	Length of Boom	Strategy Implementation	Staging Area	Site Access	Resources Protected
WR-6.9a	No field visit/ test	BNRR Bridge 45°-34.723'N 122°-44.668'W	Collection - Prevent oil from moving downriver.	Any flow	500'	Deploy boom at north end to deflect into shore; collection by portable skimmers.	Cathedral Park.	By boat from Cathedral Park. Road access limited; private property involved.	Downriver resources.
WR-6.9b	No field visit/ test	BNRR Bridge 45°-34.566'N 122°-44.900'W	Collection - Prevent oil from moving downriver.	Any flow	500'	Deploy boom at south end to deflect into shore; collection by portable skimmers.	Cathedral Park.	By boat from Cathedral Park. Road access limited; private property involved.	Downriver resources.
WR-7.5	Field test date unknown	West side below oil facilities 45°-34.177'N 122°-44.355'W	Collection - Prevent oil from moving downriver.	Low/ medium	500'	Deploy boom from the west shore down stream of the oil facilities to collect and direct oil toward the beach.	Cathedral Park.	Elf Atochem dock downriver (no road access to proposed anchor point). Contact 503-225-7210.	Downriver resources.
WR-13.4	No field visit/ test	River Place Marina 45°-30.565'N 122°-40.235'W	Deflection - Keep oil out of net pens.	Any flow	800'	Deploy boom to deflect the oil into the main channel.	Stevens Point.	By boat from the River Place Marina.	Fish net pens.
WR-13.5	No field visit/ test	OMSI 45°-30.492'N 122°-39.928'W	Deflection - Keep oil off shoreline.	Any flow	500'	Deploy boom to deflect the oil into the main channel away from the shoreline.	Stevens Point.	By boat from the River Place Marina.	Fish net pens, OMSI docks.
WR-14.1	No field visit/ test	Zidell 45°-30.005'N 122°-39.983'W	Collection - Prevent oil from moving downriver.	Any flow	500'	Deflect oil toward beach for collection.	Stevens Point.	Zidell yard.	Downriver resources.

## 5. Shoreline Information

### 5.1. Shoreline Types and Sensitivity

The following text and charts are in draft form, and are intended to serve as a training tool for countermeasure contingency planning and implementation for shoreline areas in Federal Region X. Shoreline countermeasure processes evolve to reflect increasingly efficient treatment techniques. Accordingly, the following information will be altered as new information is added.

The type of shoreline, degree of exposure to waves and currents, and biological sensitivity are the main criteria for selecting appropriate treatment techniques. Each shoreline type has particular properties (including vegetation types) which facilitate or resist the penetration and persistence of oil. Areas of comparatively uniform sediment type and grain size experience a deeper penetration of oil. Grain size definitions are:

Mud	<0.0625 mm
Fine Sand	0.0625 - 2 mm
Medium to Coarse Sand	2 - 4 mm
Pebble/Cobble	4 - 256 mm

Persistence of oil in a particular area is directly related to the intensity of wave action, tides, and currents. Based on numerous oil spill studies of shoreline characteristics, treatment, and oil impact, the matrices referred to in Section 5.3 were formulated following the basic prototype of the Environmental Sensitivity Index Atlas.

The environmental sensitivity index (ESI) system ranks coastal environments on a scale of 1-10 or 11 (less sensitive to more sensitive) with respect to oil spill sensitivity and potential biological injury is being used for mapping extensive areas of the coastline of the U.S.. Generally speaking, areas exposed to high levels of physical energy, such as wave action and tidal currents, rank low on the scale while sheltered areas have the highest ranking. The shoreline types used in this manual are a combination of the two similar systems used for the Delaware/Pennsylvania/New Jersey ESI Atlas, and the Maryland and Virginia atlases. The numbering system for the Countermeasure Manual Shoreline Types does not correspond exactly to either atlas; however, the corresponding shoreline types can be identified easily from the ESI maps and reassigned the appropriate number (after field verification.) The shoreline ranking system provides a useful first step in the design of contingency plans because it identifies the priority areas that require maximum effort for protection and cleanup. Strike teams and contractors with this document can focus their activities on environmental priorities, particularly during the first few hours and days of the spill.<sup>4</sup>

<sup>4</sup>Regional Response Team III. Draft, *Shoreline Countermeasures Manual*. (Department of the Interior, March 22, 1991).



# Ilwaco MAP

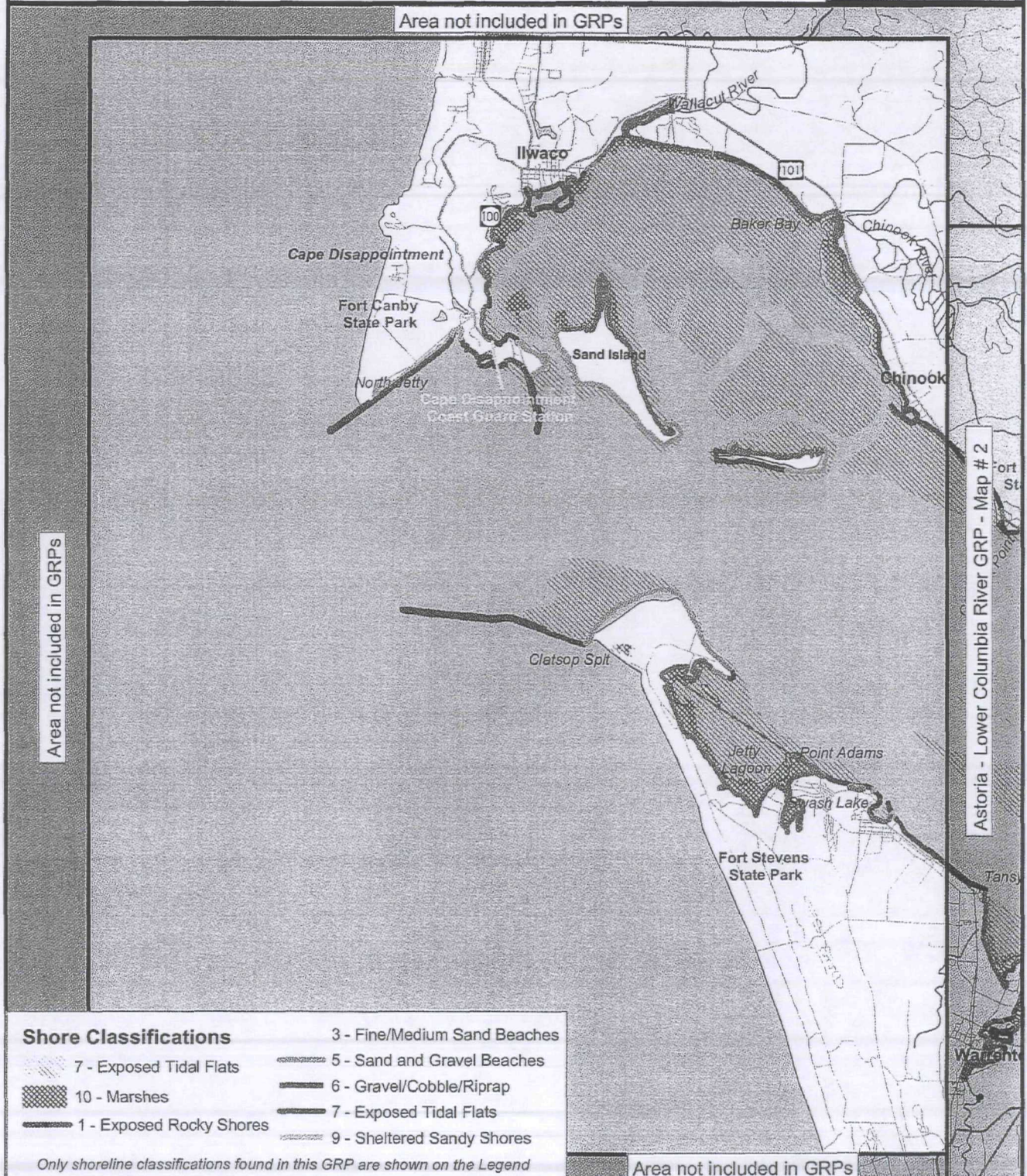
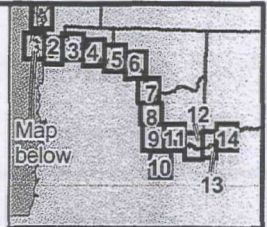
## Shoreline Classifications

November, 2003

## Lower Columbia River GRP

### MAP # 1

0 0.5 1 2 Miles





# Astoria MAP

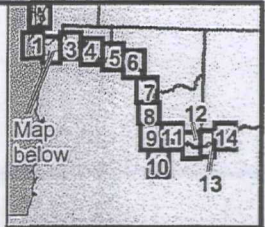
## Shoreline Classifications

November, 2003

## Lower Columbia River GRP

### MAP # 2

0 0.5 1 2 Miles

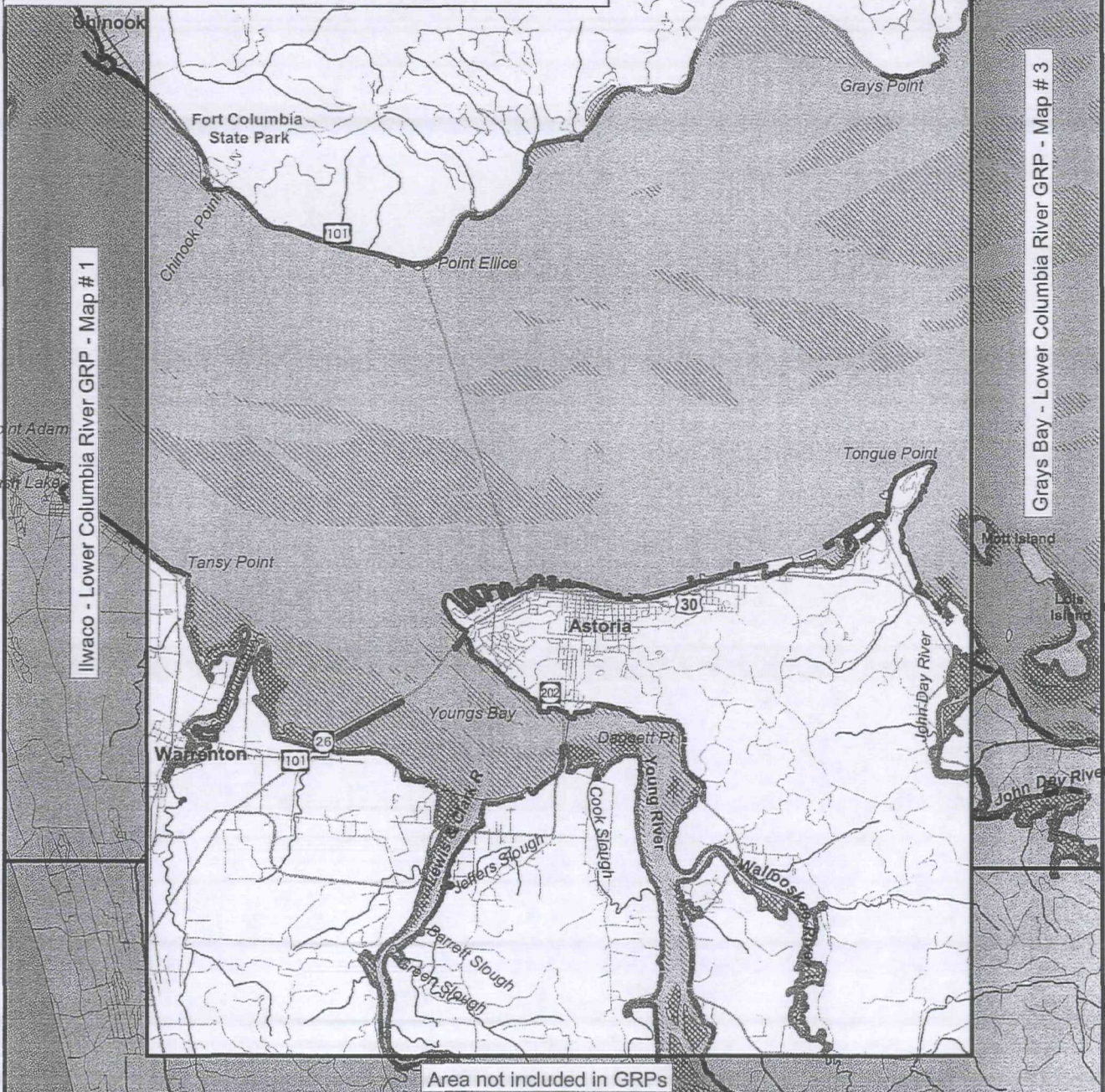


### Shore Classifications

- |                          |                              |
|--------------------------|------------------------------|
| 7 - Exposed Tidal Flats  | 3 - Fine/Medium Sand Beaches |
| 10 - Marshes             | 5 - Sand and Gravel Beaches  |
| 1 - Exposed Rocky Shores | 6 - Gravel/Cobble/Riprap     |
|                          | 7 - Exposed Tidal Flats      |
|                          | 9 - Sheltered Sandy Shores   |

Only shoreline classifications found in this GRP are shown on the Legend

Area not included in GRPs





# Grays Bay MAP

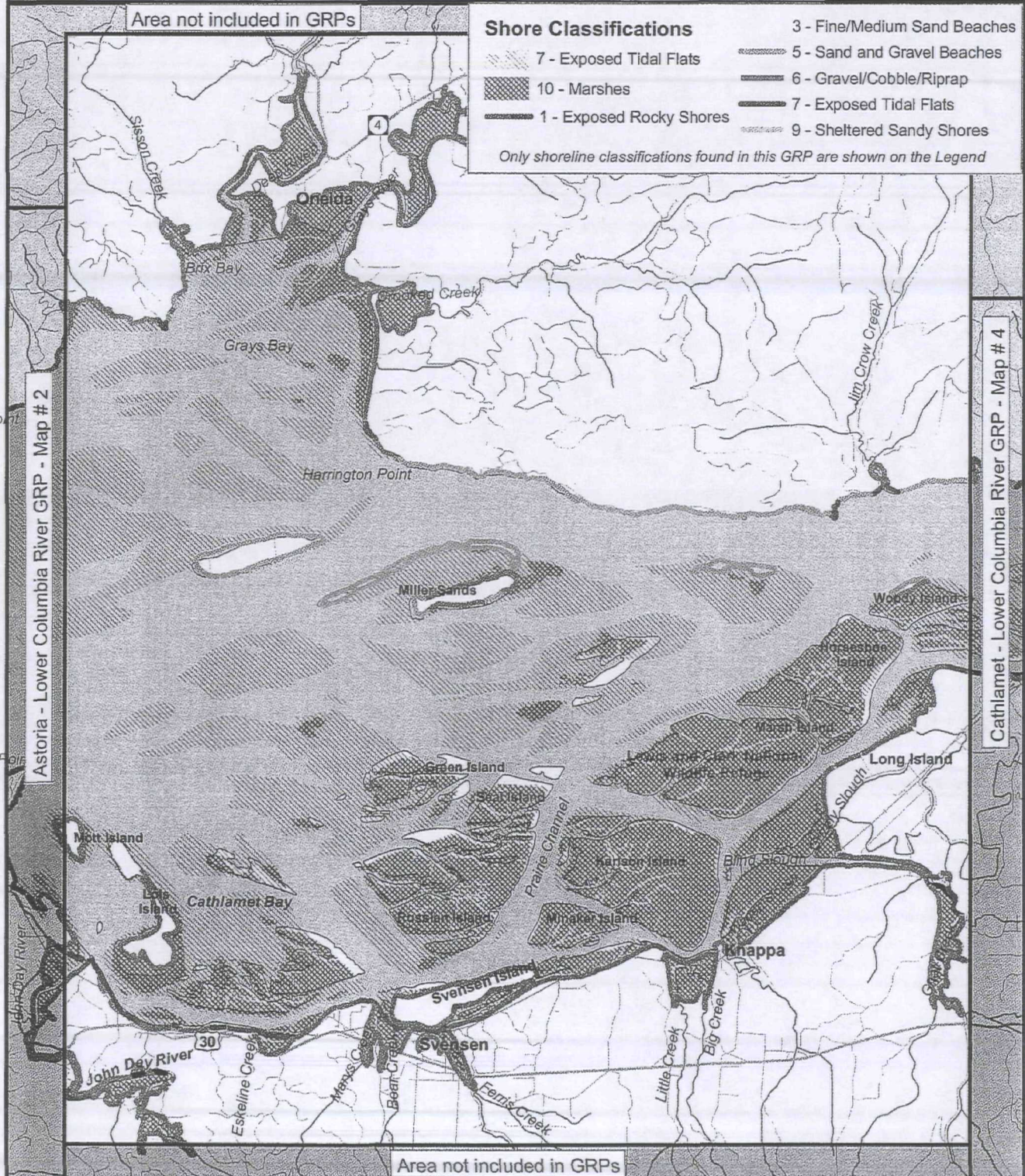
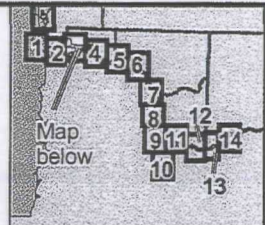
## Shoreline Classifications

November, 2003

# Lower Columbia River GRP

## MAP # 3

0 0.5 1 2 Miles



Astoria - Lower Columbia River GRP - Map # 2

Cathlamet - Lower Columbia River GRP - Map # 4



# Cathlamet MAP

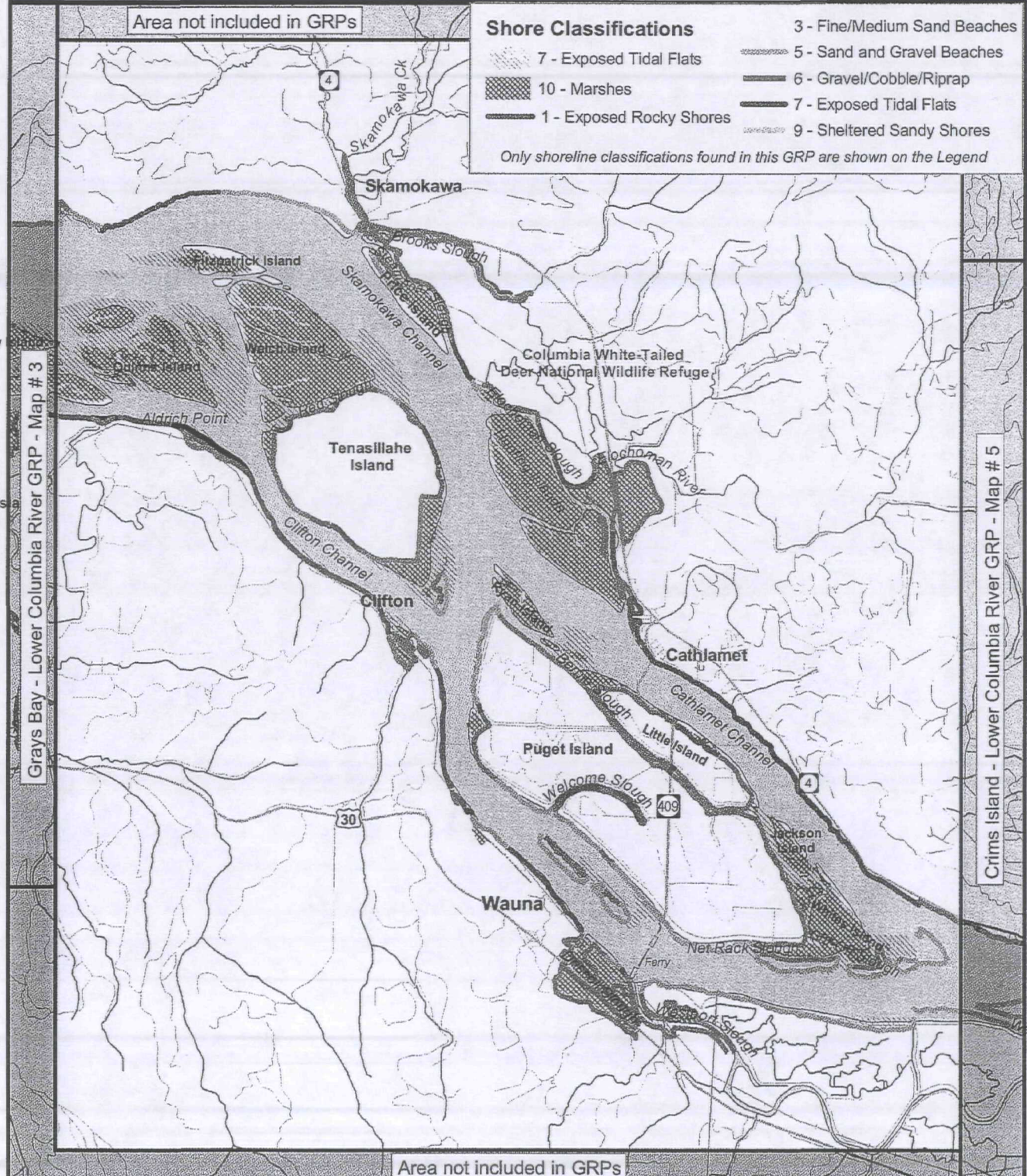
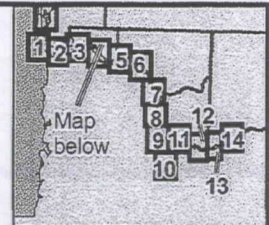
## Shoreline Classifications

November, 2003

# Lower Columbia River GRP

## MAP # 4

0 0.5 1 2 Miles





# Crims Island MAP

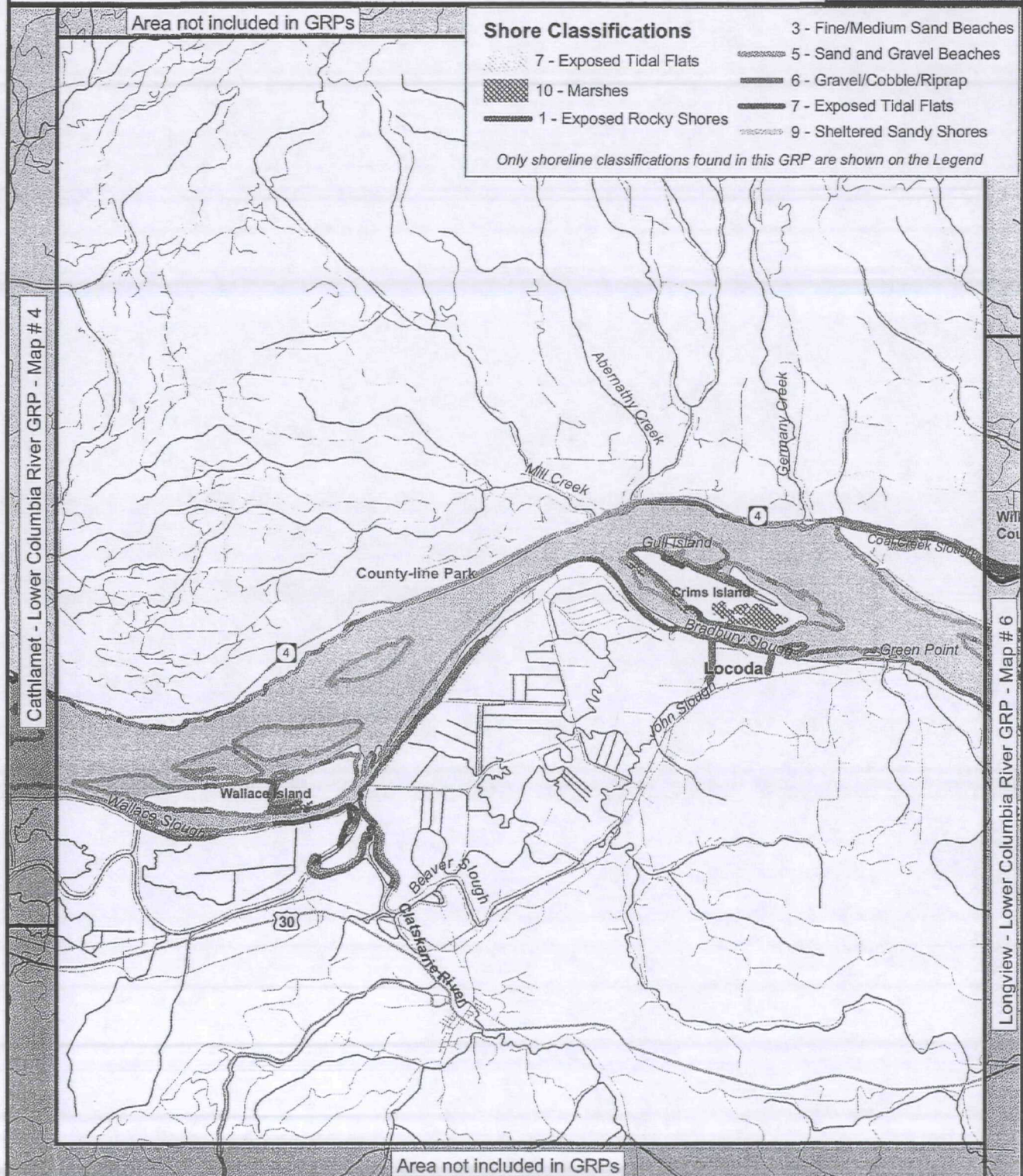
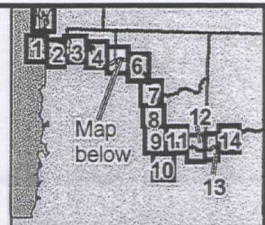
## Shoreline Classifications

November, 2003

## Lower Columbia River GRP

MAP # 5

0 0.5 1 2 Miles





# Longview MAP

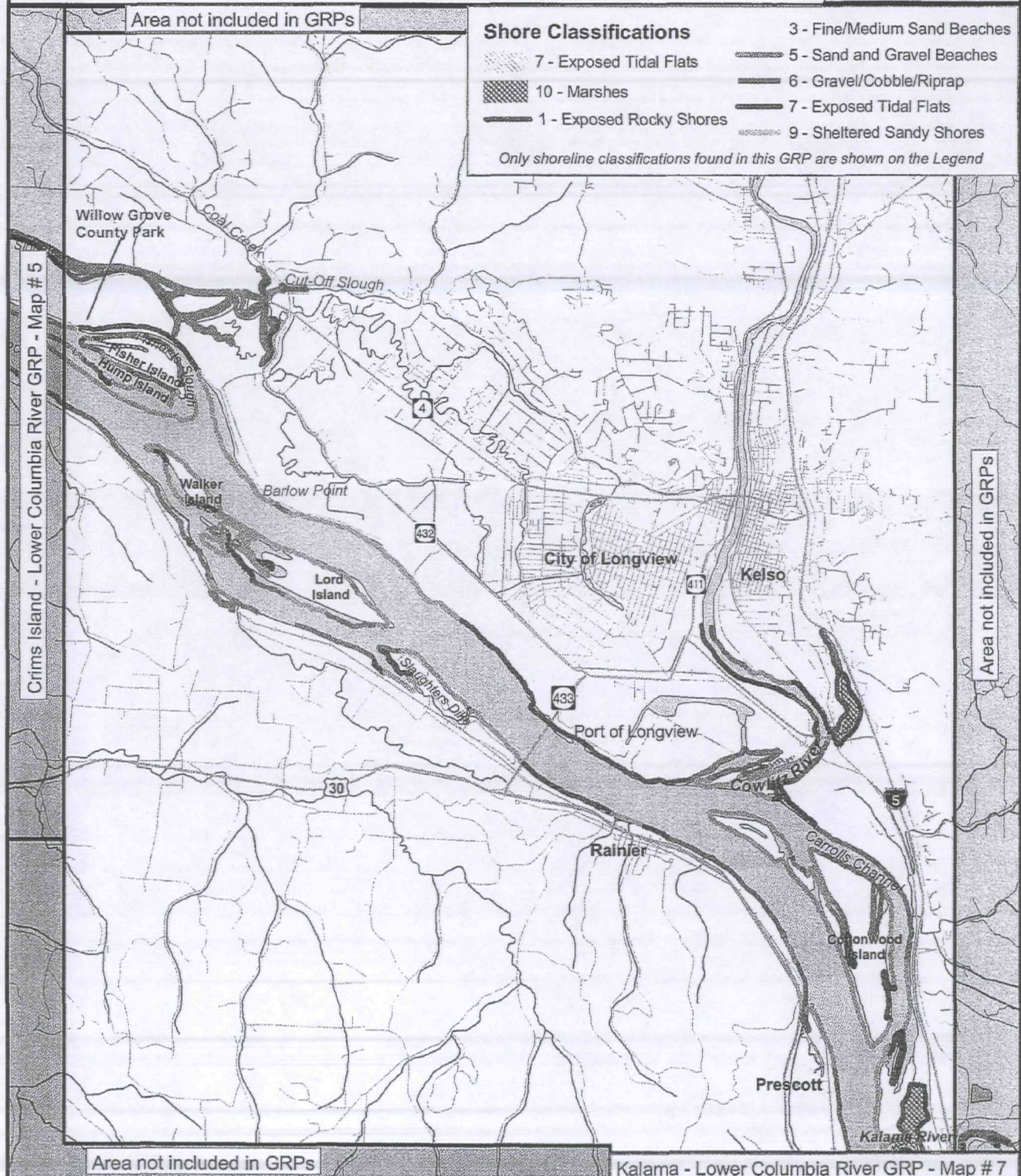
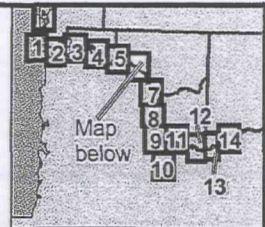
## Shoreline Classifications

November, 2003

### Lower Columbia River GRP

MAP # 6

0 0.5 1 2 Miles



Crims Island - Lower Columbia River GRP - Map # 5

Area not included in GRPs

Kalama - Lower Columbia River GRP - Map # 7



# Kalama MAP

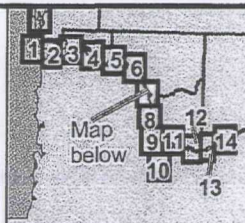
## Shoreline Classifications

November, 2003

# Lower Columbia River GRP

## MAP # 7

0 0.5 1 2 Miles



Longview - Lower Columbia River GRP - Map # 6

### Shore Classifications

- 7 - Exposed Tidal Flats
- 10 - Marshes
- 1 - Exposed Rocky Shores
- 3 - Fine/Medium Sand Beaches
- 5 - Sand and Gravel Beaches
- 6 - Gravel/Cobble/Riprap
- 7 - Exposed Tidal Flats
- 9 - Sheltered Sandy Shores

Only shoreline classifications found in this GRP are shown on the Legend.

Area not included in GRPs

Area not included in GRPs

St Helens - Lower Columbia River GRP - Map # 8



## St Helens MAP

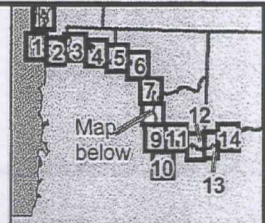
### Shoreline Classifications

November, 2003

## Lower Columbia River GRP

### MAP # 8

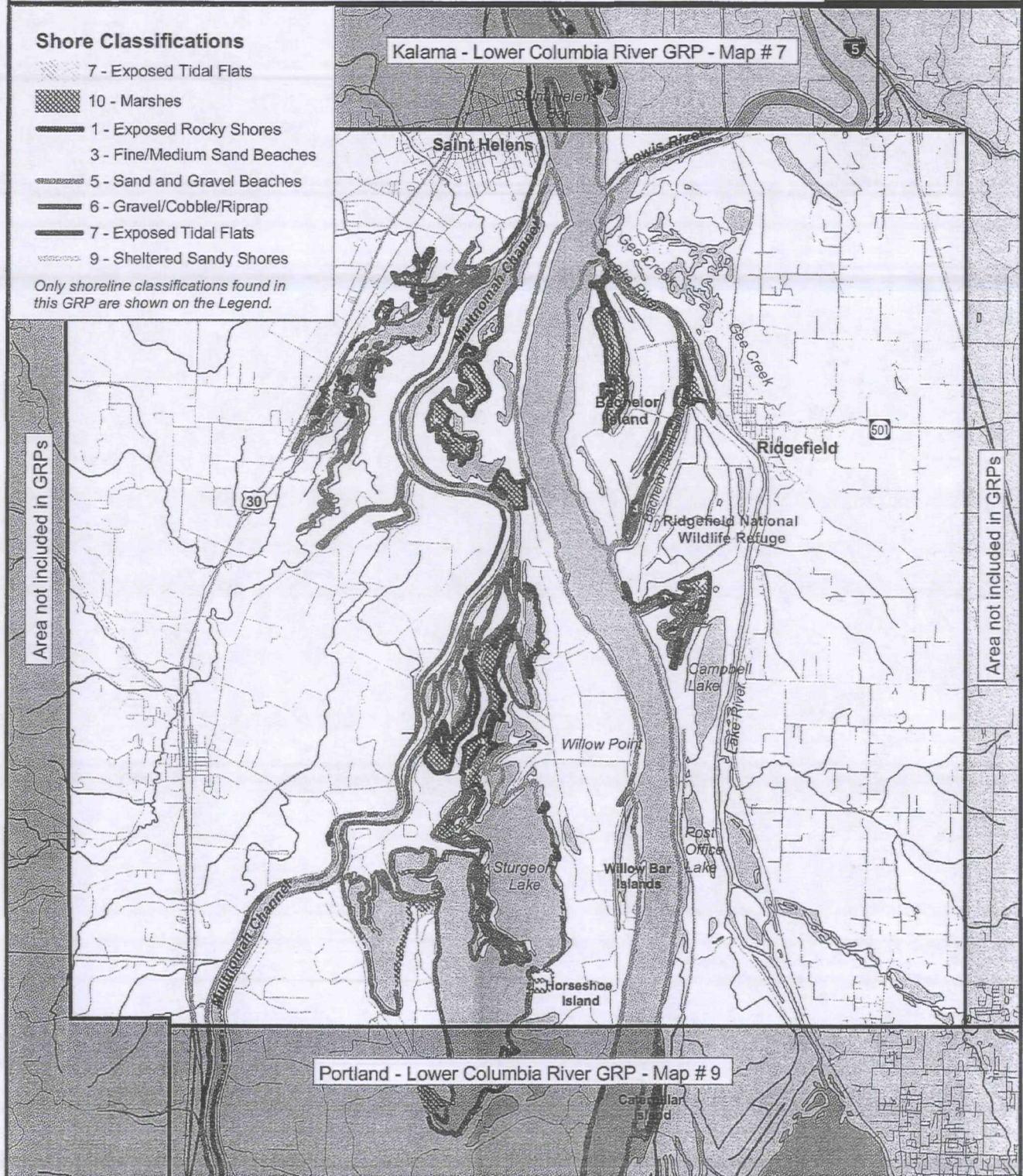
0 0.5 1 2 Miles



### Shore Classifications

- 7 - Exposed Tidal Flats
- 10 - Marshes
- 1 - Exposed Rocky Shores
- 3 - Fine/Medium Sand Beaches
- 5 - Sand and Gravel Beaches
- 6 - Gravel/Cobble/Riprap
- 7 - Exposed Tidal Flats
- 9 - Sheltered Sandy Shores

Only shoreline classifications found in this GRP are shown on the Legend.





# Portland MAP

## Shoreline Classifications

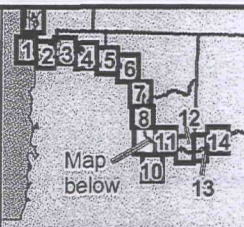
November 2003

# Lower Columbia River GRP

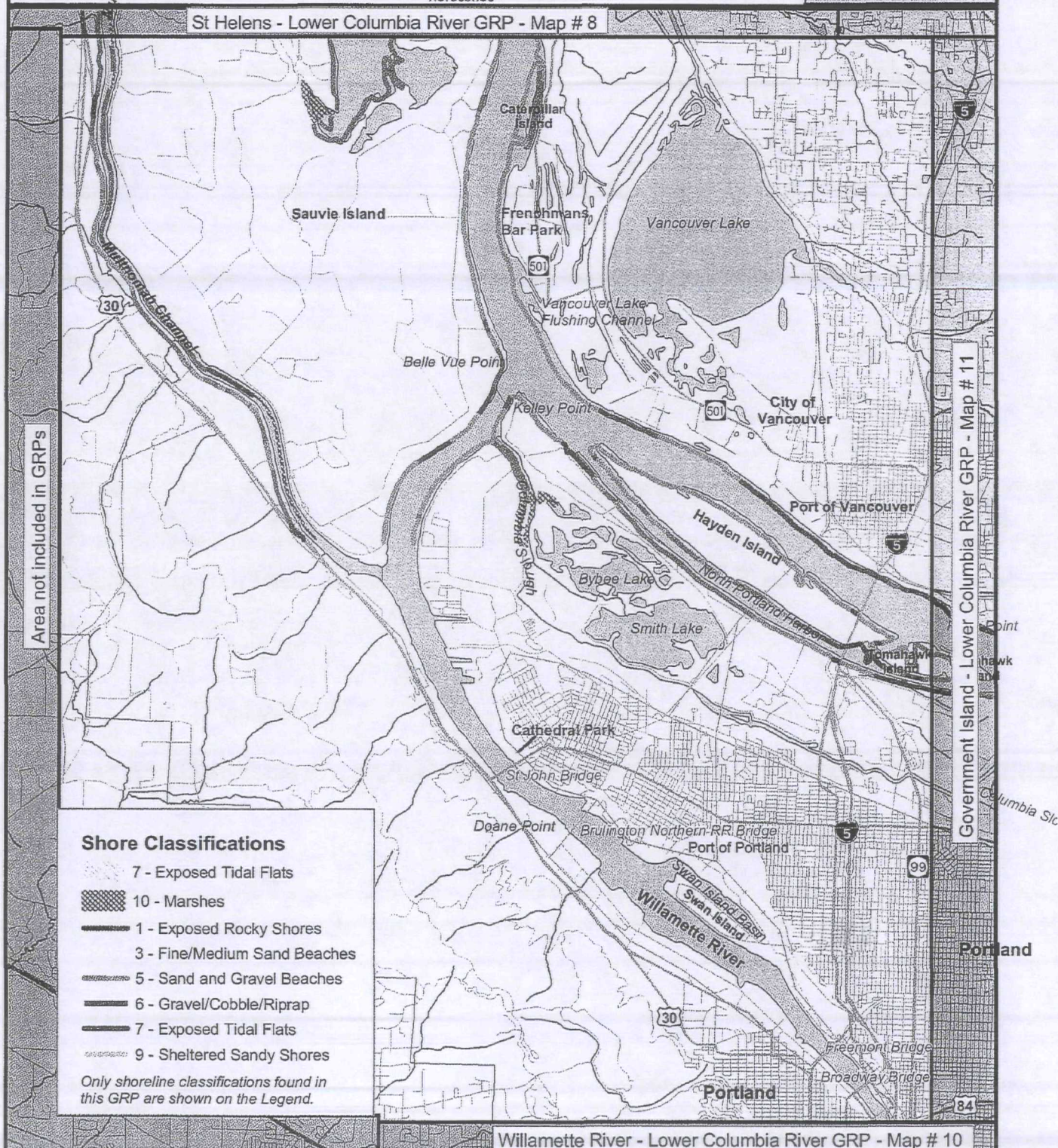
## MAP # 9

0 0.5 1 2 Miles

Horseshoe



St Helens - Lower Columbia River GRP - Map # 8



### Shore Classifications

- 7 - Exposed Tidal Flats
- 10 - Marshes
- 1 - Exposed Rocky Shores
- 3 - Fine/Medium Sand Beaches
- 5 - Sand and Gravel Beaches
- 6 - Gravel/Cobble/Riprap
- 7 - Exposed Tidal Flats
- 9 - Sheltered Sandy Shores

Only shoreline classifications found in this GRP are shown on the Legend.

Willamette River - Lower Columbia River GRP - Map # 10




### 5.3 Shoreline Countermeasure Matrices

The matrices included here show which shoreline countermeasure techniques have been considered for the fourteen shoreline types described in Chapter 2 of the "Shoreline Countermeasures Manual & Matrices", Northwest Area Plan, Chapter 9650, Page 9-37. Four matrices have been constructed for the major categories of oil (heavy, medium, light, very light).

Countermeasure methods are described in Chapters 3 and 4 of the manual. Countermeasures in Chapter 3 are traditional or conventional techniques that the OSC can use without any additional concurrence. However, the cutting of vegetation countermeasure should be used only during specific seasonal windows under specific conditions and with landowner approval. Countermeasures in Chapter 4 are described under a separate section called "Shoreline Countermeasure Methods Using Alternative Technology" may be useful in certain situations. These methods are considered more experimental and controversial in their application and potential impacts and require more formal review and consultation before implementing. The exact requirements are spelled out in the National Contingency Plan and the Northwest Area Plan. The Shoreline Countermeasures Matrices are a particularly dynamic component of the manual and should continue to be revised as the existing techniques are used and evaluated, and as both old and new techniques are refined.

Each matrix has a written explanation of how it is to be used as a countermeasure advisability matrix. The matrices are only a general guide for removing oil from shoreline substrates. They must be used in conjunction with the entire "Shoreline Countermeasures Manual" plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the State OSC operating with the FOSC's authorization has the responsibility for and authority to determine which countermeasure(s) are appropriate for the various situations encountered.

Selection of countermeasure techniques to be used in each spill is based upon the degree of oil contamination, shoreline types, and the presence of sensitive resources. Extremely sensitive areas are generally limited to manual cleanup methods. It is important to note that the primary goal of countermeasure implementation is the removal of oil from the shoreline with no further injury or destruction to the environment. The three categories of guidance used in the matrices are defined as follows:

R	Recommended	May be the preferred method that best achieves the goal of minimizing destruction or injury to the environment
C	Conditional	Viable and possibly useful but may result in limited adverse effects to the environment
	Shaded	Not applicable or not generally recommended.



## SHORELINE COUNTERMEASURES MATRIX

### Heavy Oil (Heavy Crude Oils, Intermediate Fuel Oils, Bunker C & Heavily Weathered Medium Crudes)

- Heavy oils with little or no evaporation or dissolution
- Water-soluble fraction likely to be <10ppm
- Heavy contamination of intertidal areas likely
- Severe impacts to waterfowl and fur-bearing mammals (coating and ingestion)
- Long-term contamination to sediments possible
- Weathers very slowly
- Dispersion seldom effective
- Shoreline cleanup difficult under all conditions

### SHORELINE TYPES CODES

1- Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)	6B - Gravel beaches - cobbles to boulders
2 - Exposed wave-cut platforms	6C - Exposed rip rap
3 - Fine to medium grained sand beaches & steep unvegetated river banks	7 - Exposed tidal flat
4 - Course grained sand beaches	8A- Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks, bulkheads)
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material	8B - Sheltered rubble slope
6A - Gravel beaches - pebbles to cobble	9A - Sheltered sand and mud flats
	9B - Sheltered vegetated low bank
	10 - Marshes.

### SHORELINE TYPES

COUNTERMEASURES	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	C	C	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil	C	R	R	R	R	C	C	C		R	R		C	C
Passive collection of oil	R	R	R	R	R	R	R	R	C	R	R	C	R	R
Oiled debris removal	C	R	R	R	R	R	R	R	C	R	R	C	R	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C		C					C	
Ambient water flooding (Deluge)			C	C	C	R	R	R		R	R		C	C
Amb water flush <50 psi	C	C			C	R	C	R		C	C		C	C
Amb water flush <100 psi	C	C					C	C		C	C			
Warm water flush <90°F	C						C	C		C				
Hot water flush >90°F	C									C				
Vacuum removal of oil	C	C	C	C	C	C	C	C		C	C		C	C
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement			C	C	C	C		C						
Cutting oiled vegetation							C	C		C	C		C	C
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement			C	C	C	C	C	C						C
Microbial addition														

- R Recommend - May be Preferred Alternative  
 C Conditional (Refer to NW Shoreline Countermeasures Manual)  
 Shaded areas are Not Applicable or Not Generally Recommended  
 \* Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.



## SHORELINE COUNTERMEASURES MATRIX

### Medium Oil (Most Crude Oils & Some Heavily Weathered Light Crudes)

- About 1/3 will evaporate within 24 hours
- Maximum water-soluble fraction is 10-100ppm
- Oil contamination of intertidal areas can be severe and long-term
- Impact to waterfowl and fur-bearing mammals can be severe
- Chemical dispersion is an option within 1-2 days
- Cleanup most effective if conducted quickly

### SHORELINE TYPES CODES


1- Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)	6B - Gravel beaches - cobbles to boulders
2 - Exposed wave-cut platforms	6C - Exposed rip rap
3 - Fine to medium grained sand beaches & steep unvegetated river banks	7 - Exposed tidal flat
4 - Course grained sand beaches	8A - Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks, bulkheads)
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material	8B - Sheltered rubble slope
6A - Gravel beaches - pebbles to cobble	9A - Sheltered sand and mud flats
	9B - Sheltered vegetated low bank
	10 - Marshes

### SHORELINE TYPES

COUNTERMEASURES	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	C	C	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil	C	R	R	R	R	C	C	C		R	R		C	C
Passive collection of oil	R	R	R	R	R	R	R	R	C	R	R	R	R	R
Oiled debris removal	C	R	R	R	R	R	R	R	C	R	R	C	R	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C							C	
Ambient water flooding (Deluge)			C	C	C	R	R	R		R	R		C	C
Amb water flush <50 psi	C	C			C	R	C	R		R	R		C	C
Amb water flush <100 psi	C	C					C	C		C				
Warm water flush <90°F	C						C	C		C				
Hot water flush >90°F	C									C				
Vacuum removal of oil	C	C	R	R		C	R	R		C	C		C	C
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement			C	C	C	C		C			C			
Cutting oiled vegetation							C	C		C	C		C	C
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement			C	C	C	C	C	C			C			C
Microbial addition														

**R** Recommend - May be Preferred Alternative

**C** Conditional (Refer to NW Shoreline Countermeasures Manual)

 Shaded areas are Not Applicable or Not Generally Recommended

\* Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.



## SHORELINE COUNTERMEASURES MATRIX

### Light Oil (Diesel, No 2 Fuel Oils, Light Crudes)

- Moderately volatile; will leave residue (up to 1/3 of spilled amount)
- Moderate concentrations of toxic (soluble) compounds
- Long-term contamination of intertidal resources possible
- Potential for subtidal impacts (dissolution, mixing, sorption onto suspended sediments)
- No dispersion necessary
- Cleanup can be very effective

### SHORELINE TYPES CODES

1 - Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)	6B - Gravel beaches - cobbles to boulders
2 - Exposed wave-cut platforms	6C - Exposed rip rap
3 - Fine to medium grained sand beaches & steep unvegetated river banks	7 - Exposed tidal flat
4 - Course grained sand beaches	8A - Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks, bulkheads)
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material	8B - Sheltered rubble slope
6A - Gravel beaches - pebbles to cobble	9A - Sheltered sand and mud flats
	9B - Sheltered vegetated low bank
	10 - Marshes

### SHORELINE TYPES

COUNTERMEASURES	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
CONVENTIONAL METHODS														
No action	R	R	C	C	C	C	C	C	R	C	C	R	C	R
Manual removal of oil			C	C	C	C	C	C		R	R		C	
Passive collection of oil	C	R	R	R	R	R	R	R	C	R	R	C	R	R
Oiled debris removal	C	C	R	R	R	R	R	R	C	R	R	C	C	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal			C	C	C	C								
Ambient water flooding (Deluge)			C	C	C	R	R	R			C			C
Amb water flush <50 psi		C			C	C	C	C		R	C			C
Amb water flush <100 psi														
Warm water flush <90°F														
Hot water flush >90°F														
Vacuum removal of oil							C	C						C
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement			C	C	C									
Cutting oiled vegetation							C	C		C	C		C	C
ALTERNATIVE METHODS*														
In-situ burning of shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement			C	C	C	C	C	C						C
Microbial addition														

- R Recommend - May be Preferred Alternative  
 C Conditional (Refer to NW Shoreline Countermeasures Manual)  
 Shaded areas are Not Applicable or Not Generally Recommended  
 \* Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.



## SHORELINE COUNTERMEASURES MATRIX

### Very Light Oil (Jet fuels, Gasoline)


- Highly volatile (should all evaporate within 1-2 days)
- High concentration of toxic (soluble) compounds
- Result: Localized, severe impacts to water column and intertidal resources
- Duration of impact is a function of the resource recovery rate
- No dispersion necessary

### SHORELINE TYPES CODES

1 - Exposed rock shores and vertical, hard man-made structure (e.g. seawalls)	6B - Gravel beaches - cobbles to boulders
2 - Exposed wave-cut platforms	6C - Exposed rip rap
3 - Fine to medium grained sand beaches & steep unvegetated river banks	7 - Exposed tidal flat
4 - Course grained sand beaches	8A - Sheltered vertical rock shores and vertical, hard man-made structures (e.g. seawalls, docks,
5 - Mixed sand and gravel beaches, including artificial fill containing a range of grain size and material	8B - Sheltered rubble slope
6A - Gravel beaches - pebbles to cobble	9A - Sheltered sand and mud flats
	9B - Sheltered vegetated low bank
	10 - Marshes

### SHORELINE TYPES

COUNTERMEASURES	1	2	3	4	5	6A	6B	6C	7	8A	8B	9A	9B	10
<b>CONVENTIONAL METHODS</b>														
No action	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Manual removal of oil														
Passive collection of oil			C	C	C	C	C	C						
Oiled debris removal	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Trenching/recovery wells			C	C	C									
Oiled sediment removal														
Ambient water flooding (Deluge)														C
Amb water flush <50 psi														
Amb water flush <100 psi														
Warm water flush <90°F														
Hot water flush >90°F														
Vacuum removal of oil														
Sediment reworking			C	C	C	C								
Sediment Removal-cleaning-replacement														
Cutting oiled vegetation														
<b>ALTERNATIVE METHODS*</b>														
In-situ burning on shore														
Chemical stabilization, protection, cleaning														
Nutrient enhancement														
Microbial addition														

- R** Recommend - May be Preferred Alternative  
**C** Conditional (Refer to NW Shoreline Countermeasures Manual)  
 Shaded areas are Not Applicable or Not Generally Recommended  
**\*** Follow approved process defined in NCP and NW Area Plan

This countermeasure advisability matrix is only a general guide for removal of oil from shoreline substrates. It must be used in conjunction with the entire Shoreline Countermeasures Manual plus field observations and scientific advice. The countermeasures listed are not necessarily the best under all circumstances, and any listed technique may need to be used in conjunction with other techniques (including ones not listed herein). The Federal On-Scene Coordinator (FOSC) or the state OSC operating with the FOSC's authorization has the responsibility for and the authority to determine which countermeasure(s) are appropriate for various situations encountered. Selection of countermeasures is based on the degree of oil contamination, the shoreline type, and the presence of sensitive resources.

## Purpose of Chapter 6

The information presented in this chapter highlights some of the more significant environmentally sensitive areas within the GRP region that could be impacted as a result of an oil spill. Consistent with the overall purpose of the GRP's, this information is only intended to provide a level of detail required during the initial phase of spill response. During an actual event, additional resource information will be available from the resource trustee agencies supporting the Environmental Unit in the Planning Section. Specific resource concerns for areas that already have designated protection strategies in Chapter 4 of the GRP may be found in the "Resources Protected" column in the matrix describing the individual strategies.

The information provided in Chapter 6 is intended for use in:

- o Preparing an initial ICS 232 form (Resources-at-Risk summary) for Incident Command
- o Identifying those sites where it may be necessary to implement Flight Restriction Zones in order to prevent disturbance/injury to sensitive wildlife species.
- o Identifying sensitive shoreline habitats to assist SCAT teams in their initial assessments and to help personnel in the Environmental Unit in developing appropriate cleanup strategies.

Chapter 6 consists of two sets of maps and tables - one for wildlife and the other for fish, shellfish and selected sensitive marine habitats. These data are presented separately, both for ease of reading and because each of the two data sets has slightly different applications within the context of spill response.

The wildlife maps and tables present information on the location and seasonal sensitivity of key wildlife resources. Types of data included here are concentration areas for waterfowl, marine birds and shorebirds; seabird colonies; nesting areas for sensitive species such as eagles, herons and falcons; and marine mammal haulout sites. This information is intended for the rapid identification of areas where significant wildlife oiling impacts could be anticipated and to denote areas where flight restriction zones may be required to protect sensitive wildlife. Each site depicted on these maps is identified by a unique number in order to facilitate the process of communicating Flight Restriction Zone recommendations to the Operations Section in ICS. The tables accompanying the wildlife maps present information on the season(s) during which sites may be particularly sensitive to disturbance.

The fish/shellfish/marine habitat maps present general information on the location of baitfish spawning beaches, herring spawning areas, streams used by anadromous salmonids, hardshell clam concentrations, and kelp and eelgrass beds. This information will be most useful to personnel involved in assessing initial risks to fish and shellfish resources and to those conducting initial beach reconnaissance, pending availability of more detailed resource information and the formation of SCAT teams.

Because the operational uses of this information differ from those of the wildlife data, individual site identification numbers have not been assigned. Tables associated with these maps will identify the seasonal sensitivity of each resource. In addition, notes accompanying each table will provide information on the general distribution and seasonal sensitivity of those resources that are not mapped but may occur anywhere in the GRP region (ex. juvenile salmonids in shallow nearshore waters).



## **6. Sensitive Resource Description**

### **6.1. Chapter Overview**

Despite major alterations to the Columbia River over the past hundred years, it still provides habitat to hundreds of species of fish and wildlife. Fortunately, several National Wildlife Refuges exist along its course to protect pockets of natural habitat. A brief summary of fish and wildlife found in the lower Willamette and Columbia Rivers follows - more detailed information and maps on particular wildlife concentration areas can be found in Section 6.6

### **6.2. Fish**

From the tiny sandroller to the mighty white sturgeon, the lower Columbia/Willamette River system hosts a remarkable array of fish species. Populations of some species have been devastated by hydroelectric dams, overfishing, and habitat alterations. In particular, a number of salmonid stocks have been listed or proposed for listing as threatened or endangered under the federal Endangered Species Act. However, other fish species are coming back and providing some of the best recreational fishing in the nation. Chinook salmon, steelhead, walleye, large-mouthed and small-mouthed bass, white sturgeon, American shad, and smelt are just a few of the popular recreational species. Some of these fish are also commercially harvested in gillnets.

### **6.3. Wildlife**

#### **Mammals**

Many species of mammals abound along unaltered shorelines and on islands in the lower Columbia River and lower Willamette River. Harbor seals are quite common and increasing in numbers in the Columbia River estuary. California sea lions, which are also on the increase, can be found from the estuary to Bonneville Dam as they follow the fish runs.

The endangered Columbia white-tailed deer is now limited to the mainland and islands near Puget Island. Elk and black-tailed deer occur in many localities along the river. Other mammals likely to be seen include river otter, mink, beaver, muskrat, nutria, raccoon, and coyote. Numerous species of other small mammals abound in the appropriate habitats bordering the rivers.

#### **Birds**

Besides being known as a premier waterfowl hunting area, the lower Columbia River and portions of the Willamette River are quite famous as a birdwatching destination. Outstanding birding locations include Astoria, Ilwaco, Ridgefield National Wildlife Refuge, and Sauvie Island. During the winter, the lower Columbia River hosts hundreds of thousands of ducks, geese, and swans. Some of the species of waterfowl most likely to be seen include Tundra swan, five subspecies of Canada goose, green-winged teal, mallard, northern pintail, American widgeon, ring-necked duck, lesser scaup, common goldeneye, bufflehead, hooded merganser, and common merganser. Other waterbirds found in winter include loons, grebes, cormorants, and gulls. During spring and fall migration, these same birds are accompanied by numerous shorebirds and terns. One of the most impressive migrants, the sandhill crane, can be found at Ridgefield National Wildlife Refuge. Raptors are abundant also - the lower Columbia River is an excellent location to view bald eagles, northern harriers, red-tailed hawks, peregrine falcons, and merlins.

While most species head north for the breeding season, many birds nest along the Columbia River as well. Colony nesting species include Brandt's and double-crested cormorants, Caspian terns, western and ring-billed

gulls, and great blue herons. Other birds that breed here include bald eagles, osprey, the Great Basin subspecies of Canada goose, mallards, and many species of songbirds.

#### **6.4. Flight Restriction Zones/ Sensitive Wildlife**

Flight restriction zones have been designated in the GRP to minimize disturbance to certain wildlife species. An identified location could represent a heron colony or the individual nest of a sensitive species such as bald eagle. While some zones may be restricted year around, others will be in effect only during the months listed in the matrix.

The no-fly bubble is the area within a 1,500 foot radius and below 1,000 feet in altitude around the location.

All aircraft, including those from the government, contractors or media, are expected to avoid these zones when restrictions are in effect. In the event that one of these zones must be entered during a spill response in the lower Columbia River, clearance must be obtained from the Washington Department of Fish and Wildlife (WDF&W) and the United States Fish and Wildlife Service (USFWS).

During oil spills, pilots are also asked to avoid disturbing any large concentrations of birds and other wildlife. By keeping a safe distance or altitude, pilots can prevent the accidental hazing of unaffected wildlife into oiled areas and minimize the risk of aircraft/ bird collisions.

#### **6.5. Hazing**

Hazing or directed harassment, is a method used to drive or herd wildlife out of an area where they are at risk of becoming oiled. Hazing techniques include the use of visual and audio devices, personnel for herding, vessels and aircraft. In the right circumstances it can be an effective tool for protecting some wildlife species. In other cases it can be disastrous as unaffected wildlife can be driven into oiled areas, or forced to abandon nests or young.

Before hazing can begin for all species of wildlife in the Dalles Pool, clearance must be obtained from the Washington Department of Fisheries and Wildlife and the United States Fish and Wildlife Service. All hazing efforts during a spill will be directed by these agencies. The deliberate harassment of wildlife without first securing permission from these agencies is a violation of Federal and State laws.

The following information must be provided for a determination on whether hazing might be authorized in a given situation.

1. Description of the situation where hazing authorization is being sought
2. Location to be hazed
3. Species of wildlife to be hazed and number of animals
4. Methods and equipment used
5. Date and time of hazing
6. Name, phone number, radio frequency, pager number and the amount of hazing experience of the individual requesting permission

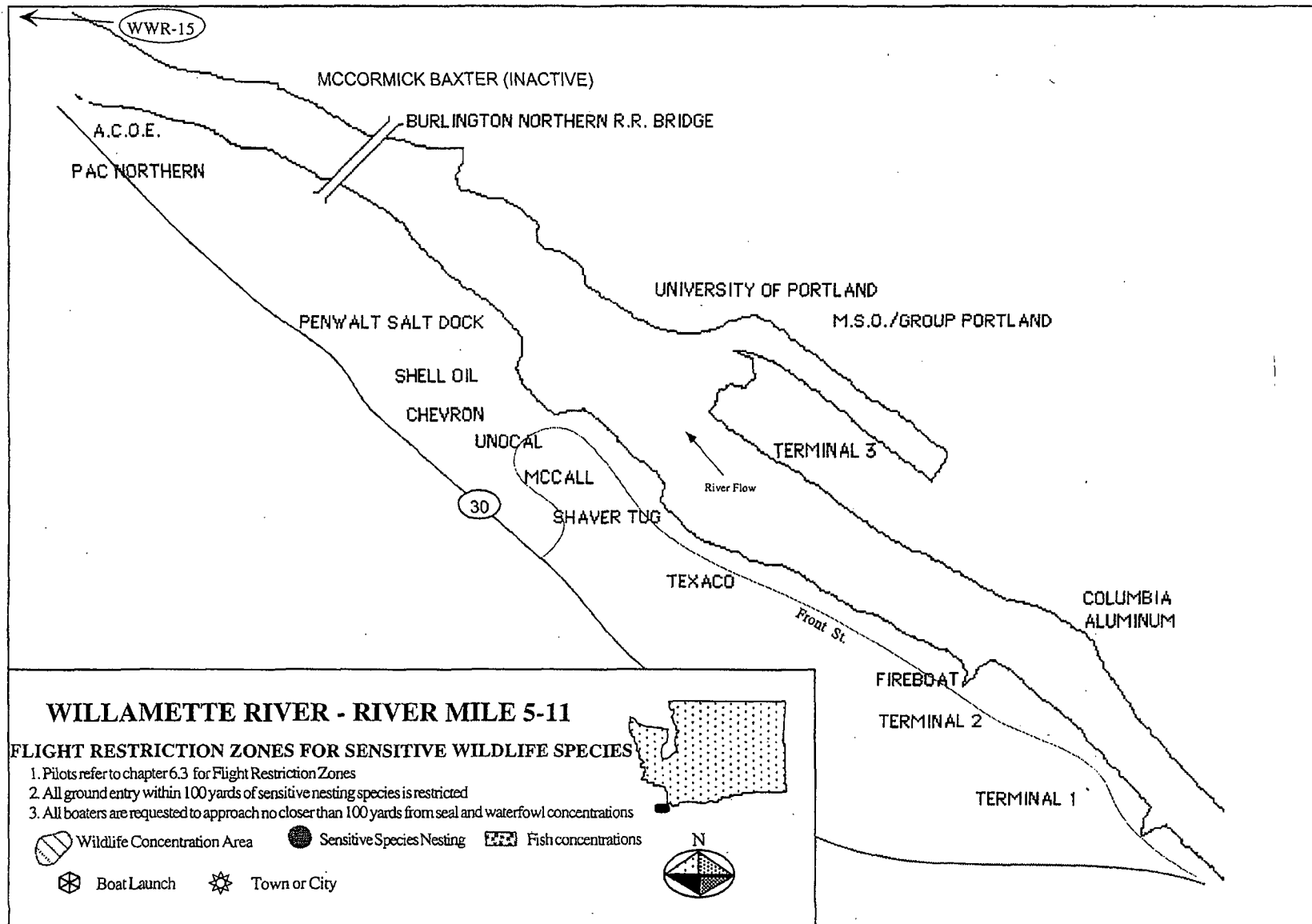
The responsible agencies will evaluate each request on a case by case basis. All hazing of marine mammals, threatened and endangered species, and all hazing by aircraft will be performed only under authority and general supervision of WDF&W, USFWS, NMFS or persons designated by these agencies. Representatives of these agencies can be contacted through the planning section of the Unified Command System during the spill event.

LOWER WILLAMETTE RIVER FISH & WILDLIFE RESOURCES																				
Willamette River Mile 5-11																				
			Seabird	Waterfowl	Marine	Sensitive	Shorebird	Flight												
Code	Location	Turtles	Conc	Conc	Mammal	Nesting	Conc	Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WWR-15	St. John's Bridge					Yes		Yes												

\* FLIGHT AND GROUND ENTRY RESTRICTIONS

Flights below 1000 feet require clearance

Sensitive season - Minimize overflight disturbance



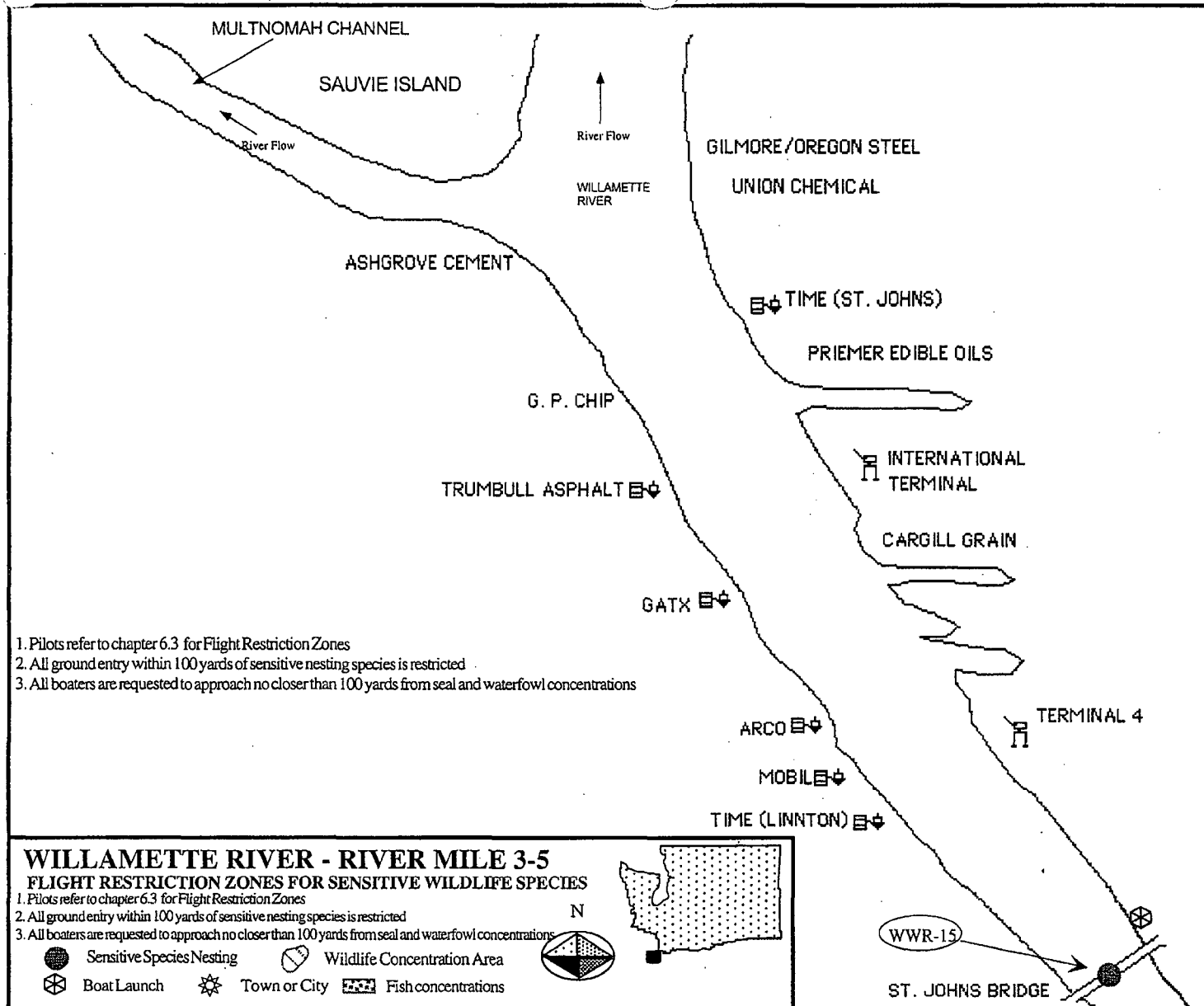
LOWER WILLAMETTE RIVER FISH & WILDLIFE RESOURCES																						
Willamette River Mile 3-5																						
Code	Location	Turtles	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
WWR-15	St. John's Bridge					Yes		Yes														

\* FLIGHT AND GROUND ENTRY RESTRICTIONS

Flights below 1000 feet require clearance

Sensitive season - Minimize overflight disturbance



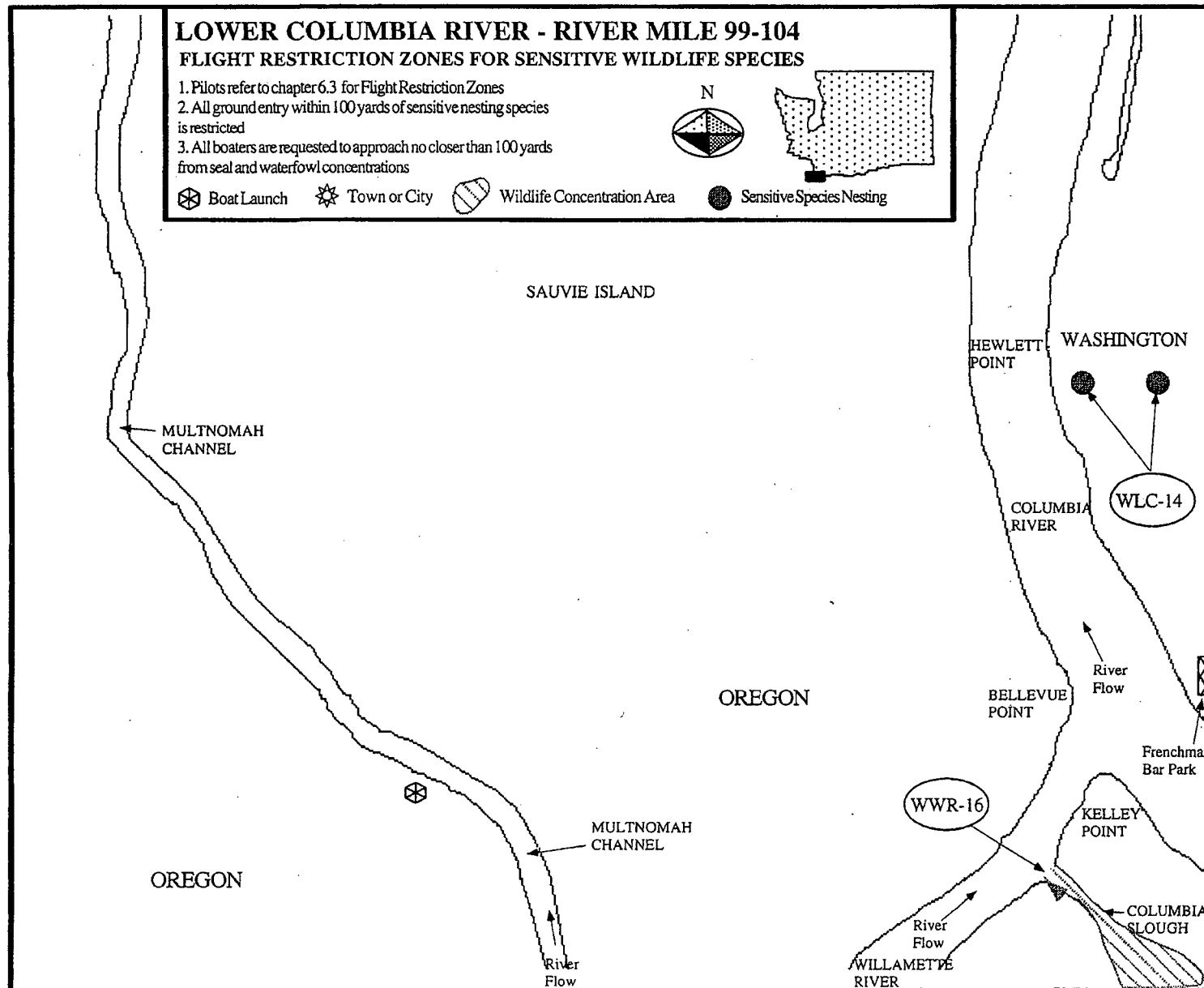


LOWER COLUMBIA RIVER FISH & WILDLIFE RESOURCES																					
River Mile 99-104																					
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
WWR-16	Columbia Slough					Yes		Yes													
WLC-14	Hewlett Point					Yes		Yes													

\* FLIGHT AND GROUND ENTRY RESTRICTIONS

Flights below 1000 feet require clearance

Sensitive season - Minimize overflight disturbance



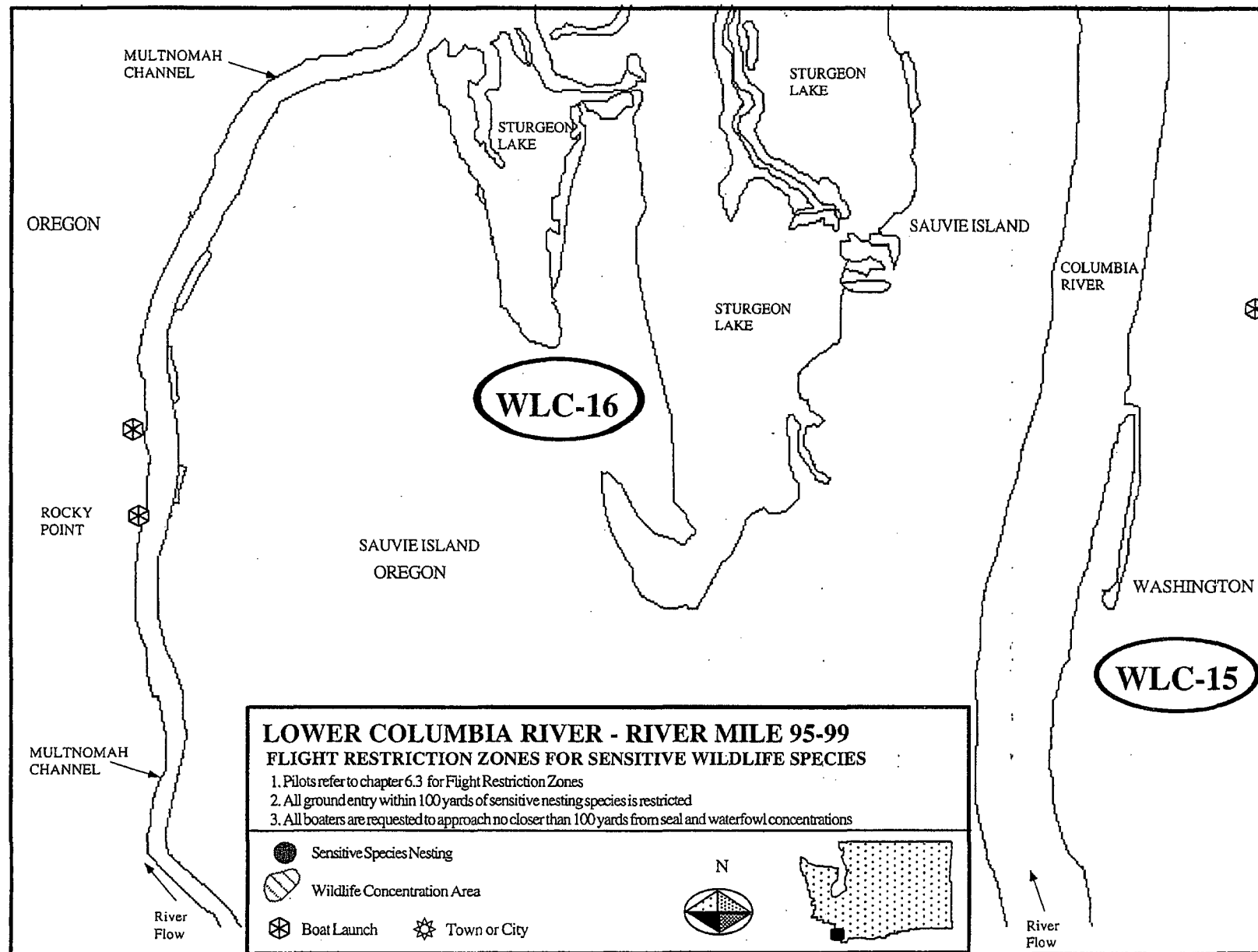
LOWER COLUMBIA RIVER WILDLIFE RESOURCES																							
River Mile 95-99												PERIOD OF SENSITIVITY											
		Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
Code	Location																						
WLC-15	Vancouver Lake area			Yes		Yes		Yes															
WLC-16	Sturgeon Island area					Yes		Yes															

\* FLIGHT AND GROUND ENTRY RESTRICTIONS

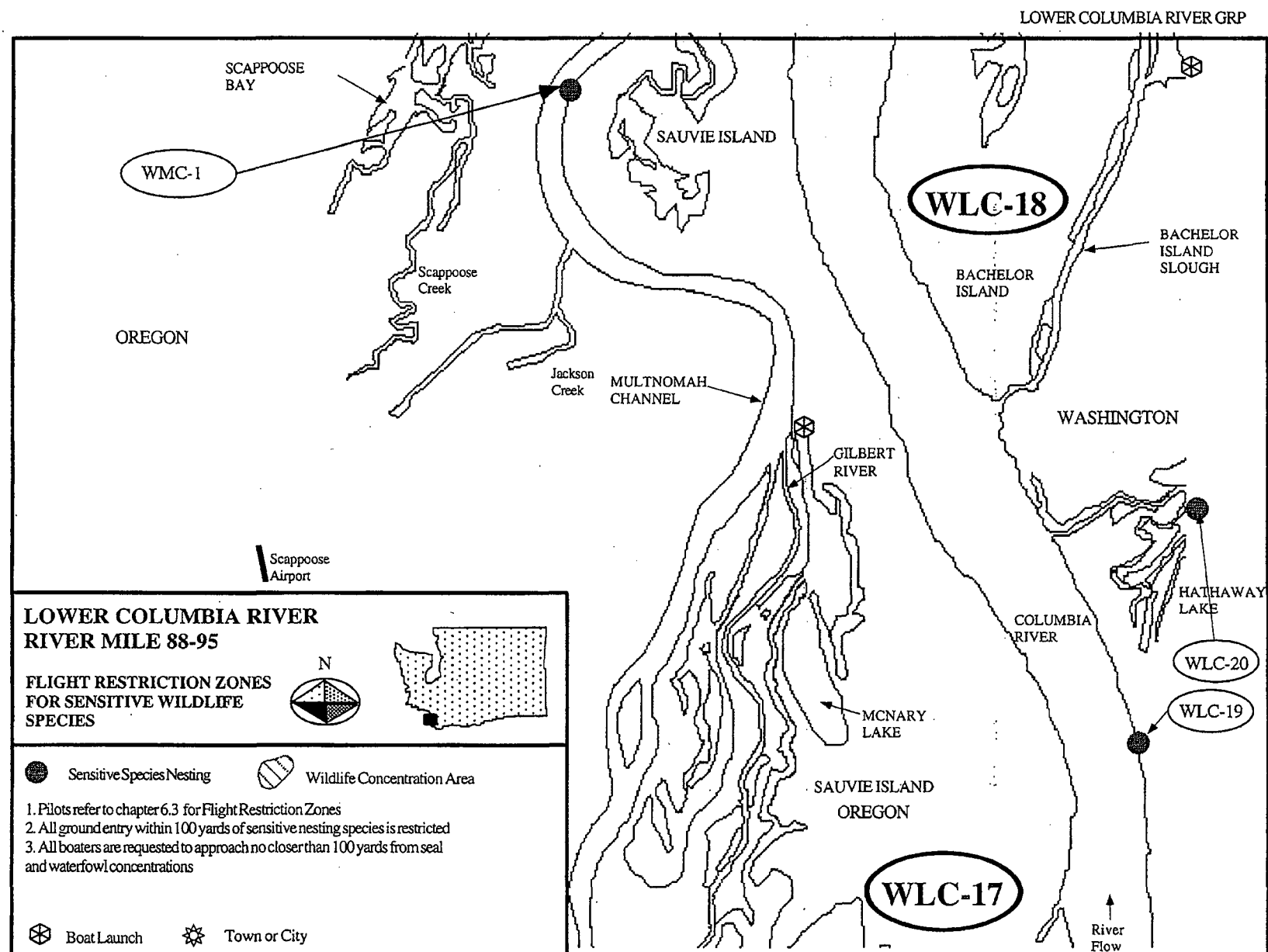
Flights below 1000 feet require clearance

Sensitive season - Minimize overflight disturbance



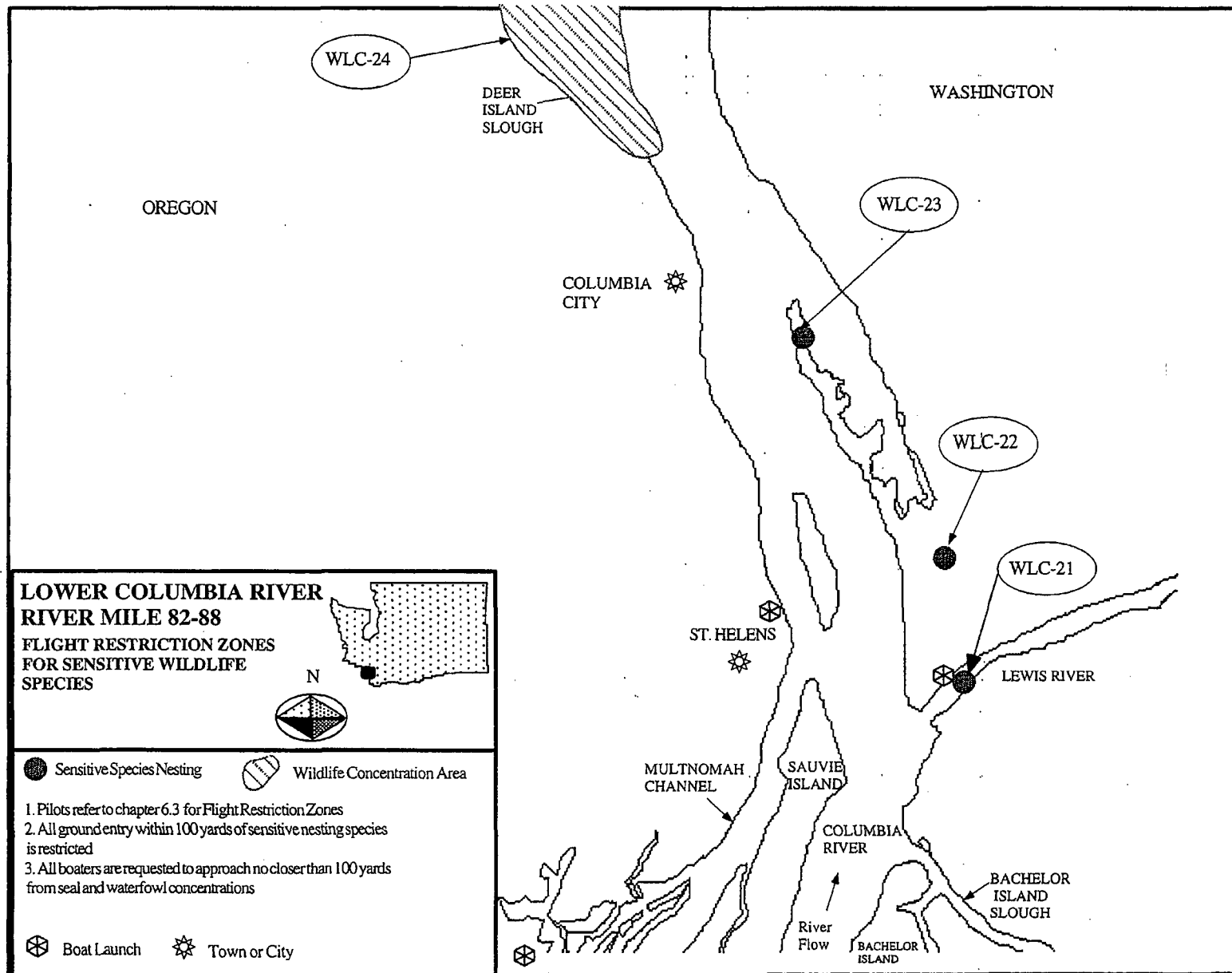




LOWER COLUMBIA RIVER WILDLIFE RESOURCES																							
River Mile 88-95										PERIOD OF SENSITIVITY													
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
WLC-17	McNary Lake area			Yes		Yes	Yes	Yes															
WLC-18	Bachelor Island			Yes		Yes	Yes	Yes															
WLC-19	Lake River					Yes		Yes															
WLC-20	Bachelor Island Slough					Yes		Yes															
WMC-1	Cunningham Slough					Yes		Yes															
<div><div>* FLIGHT AND GROUND ENTRY RESTRICTIONS</div><div><div></div>Flights below 1000 feet require clearance</div><div><div></div>Sensitive season - Minimize overflight disturbance</div></div>																							

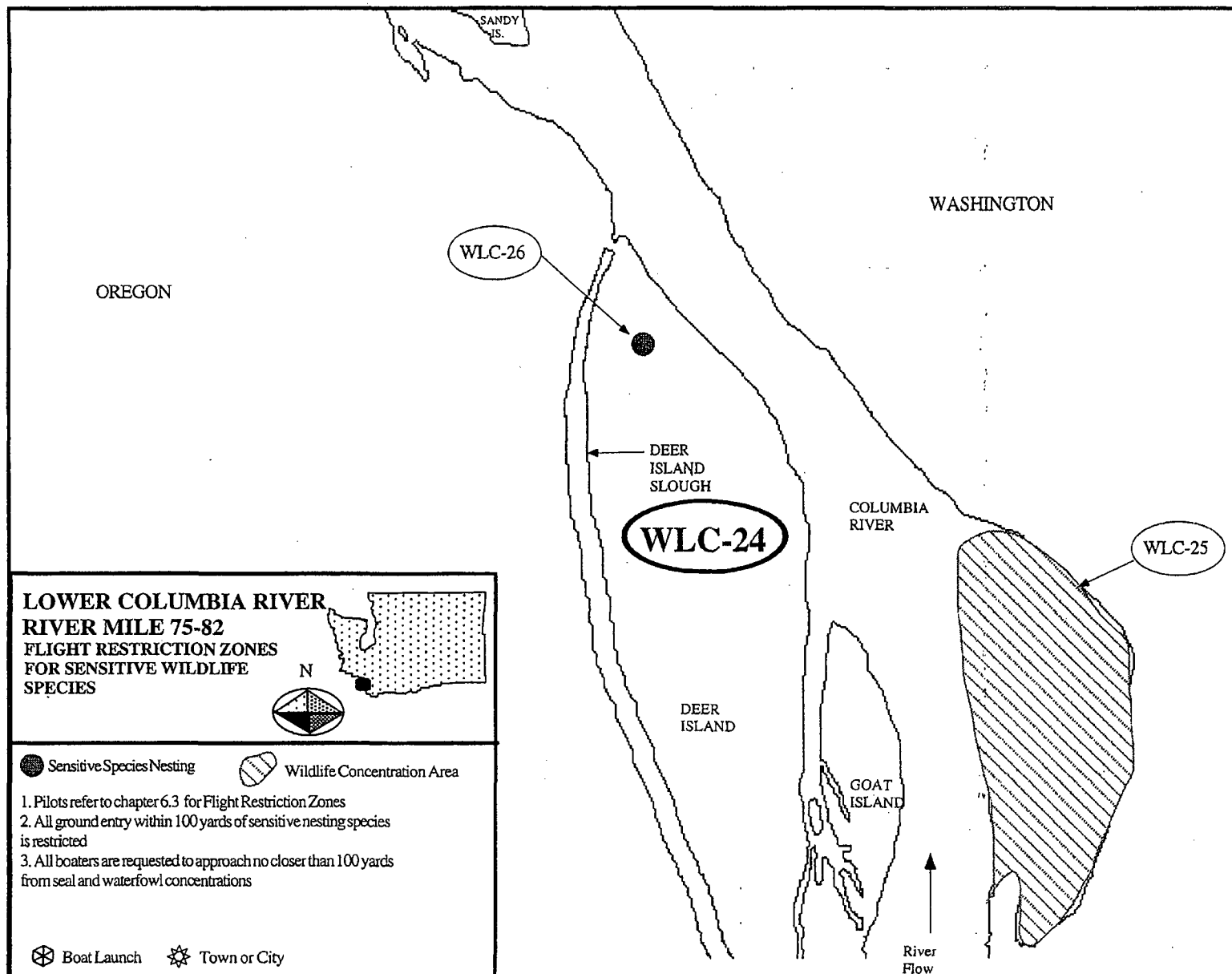




LOWER COLUMBIA RIVER WILDLIFE RESOURCES																					
River Mile 82-88										PERIOD OF SENSITIVITY											
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
WLC-21	Lewis River					Yes		Yes													
WLC-22	South of Goerig Slough					Yes		Yes													
WLC-23	Southeast of Goerig Slough					Yes		Yes													
WLC-24	Deer Island			Yes				Yes													
LOWER COLUMBIA RIVER FISHERY RESOURCES																					
River Mile 82-88										PERIOD OF SENSITIVITY											
Code	Location	Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
FLC-6	Salmon Creek	D					D														
FLC-7	Lewis River	D		H		H	D														
FLC-8	East Fork Lewis River	D	U			H	D														
FLC-9	North Fork Lewis River		D																		
* FLIGHT AND GROUND ENTRY RESTRICTIONS										FISH STOCK STATUS											
Flights below 1000 feet require clearance										C - CRITICAL											
Sensitive season - Minimize seasonal disturbance										D - DEPRESSED											
										H - HEALTHY											
										U - UNKNOWN											



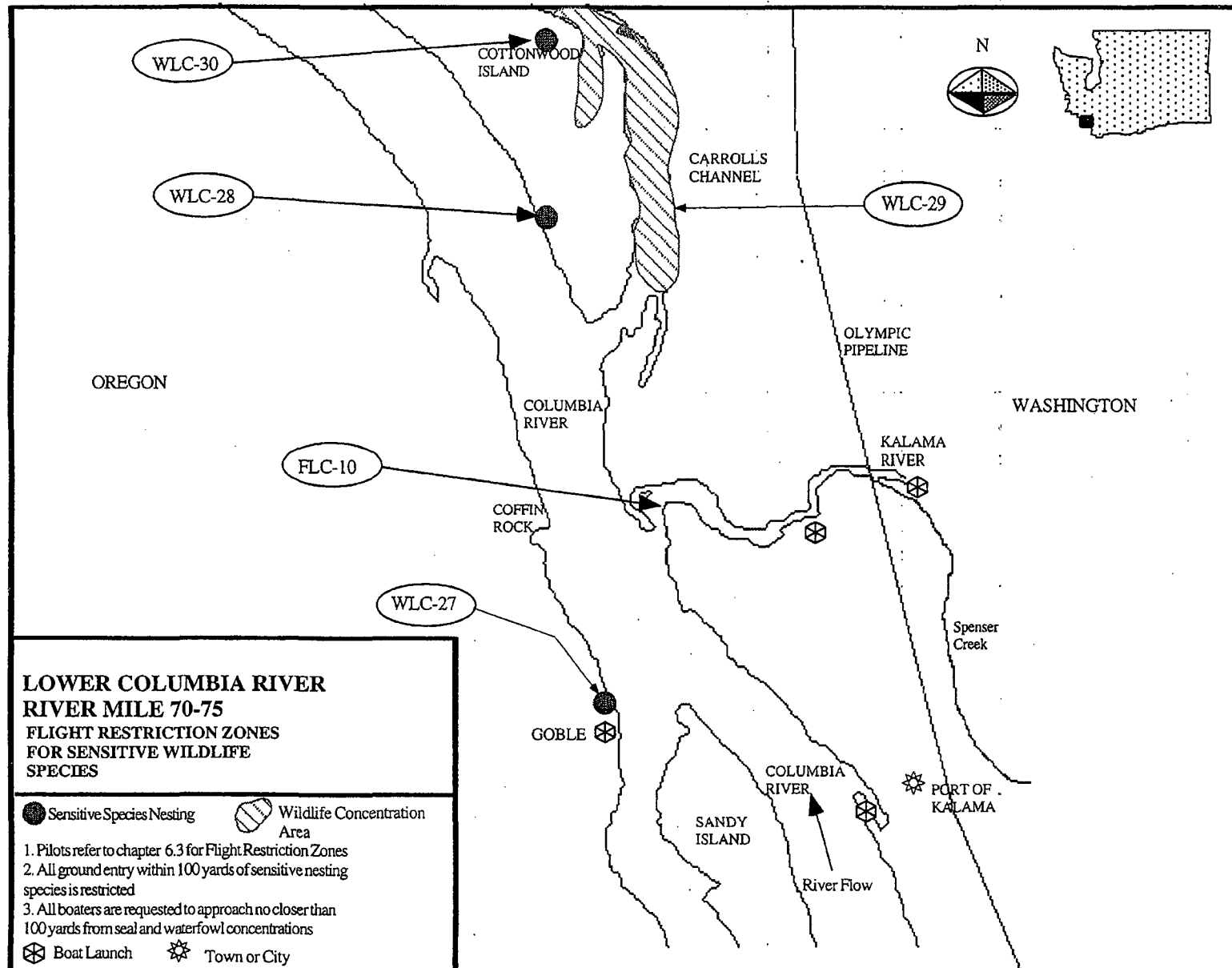




LOWER COLUMBIA RIVER WILDLIFE RESOURCES																						
River Mile 76-82																						
		PERIOD OF SENSITIVITY																				
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
WLC-24	Deer Island			Yes				Yes														
WLC-25	Martin and Burke Islands			Yes				Yes														
WLC-26	Deer Island					Yes		Yes														
<div> <p>* FLIGHT AND GROUND ENTRY RESTRICTIONS</p> <p> Flights below 1000 feet require clearance</p> <p> Sensitive season - Minimize overflight disturbance</p> </div>																						



LOWER COLUMBIA RIVER WILDLIFE RESOURCES																					
River Mile 70-75										PERIOD OF SENSITIVITY											
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
WLC-27	Goble					Yes		Yes													
WLC-28	Cottonwood Island					Yes		Yes													
WLC-29	Carrolls Channel			Yes				Yes													
WLC-30	Cottonwood Island					Yes		Yes													
LOWER COLUMBIA RIVER FISHERY RESOURCES																					
River Mile 70-75										PERIOD OF SENSITIVITY											
Code	Location	Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
FLC-10	Kalama River	H	D	H		H	D														
<p><b>* FLIGHT AND GROUND ENTRY RESTRICTIONS</b></p> <p> Flights below 1000 feet require clearance</p> <p> Sensitive season - Minimize seasonal disturbance</p>										<p><b>FISH STOCK STATUS</b></p> <p>C - CRITICAL</p> <p>D - DEPRESSED</p> <p>H - HEALTHY</p> <p>U - UNKNOWN</p>											

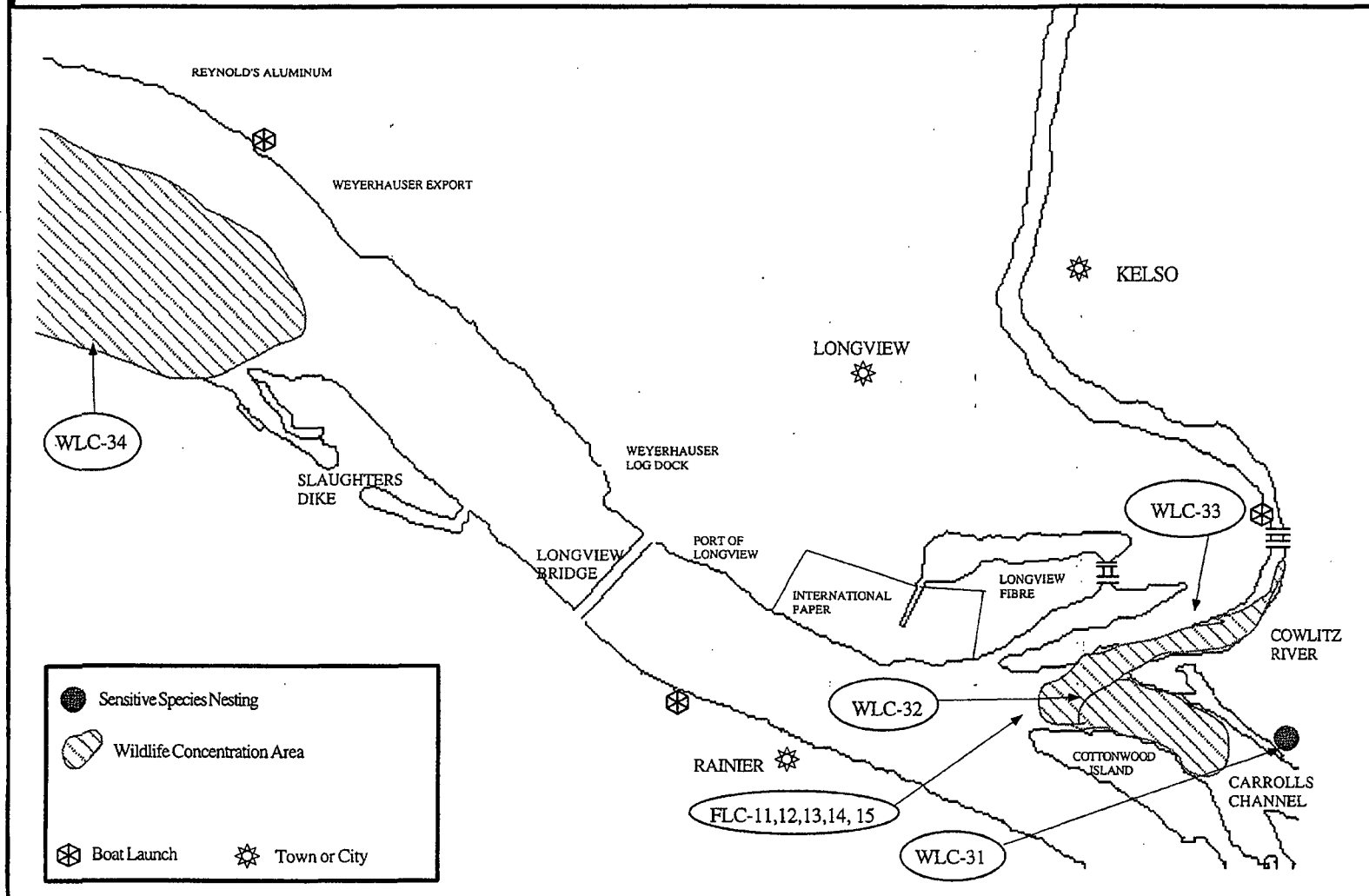
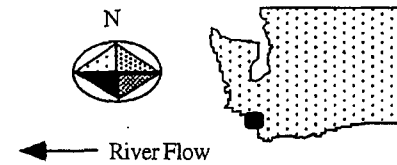



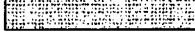


LOWER COLUMBIA RIVER WILDLIFE RESOURCES																					
River Mile 63-70										PERIOD OF SENSITIVITY											
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WLC-31	Carrolls Channel					Yes		Yes													
WLC-32	Carrolls Channel				Yes																
WLC-33	Cowlitz River		Yes																		
WLC-34	Lord Island			Yes				Yes													
LOWER COLUMBIA RIVER FISHERY RESOURCES																					
River Mile 63-70										PERIOD OF SENSITIVITY											
Code	Location	Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
FLC-11	Cowlitz River	D		H		H	D														
FLC-12	Coweeman River	D				H	D														
FLC-13	Mainstem/ North Fork Toutle River	D					D														
FLC-14	South Fork Toutle River	H				D	D														
FLC-15	Green River	D				D	D														
* FLIGHT AND GROUND ENTRY RESTRICTIONS  Flights below 1000 feet require clearance  Sensitive season - Minimize seasonal disturbance										FISH STOCK STATUS C - CRITICAL D - DEPRESSED H - HEALTHY U - UNKNOWN											

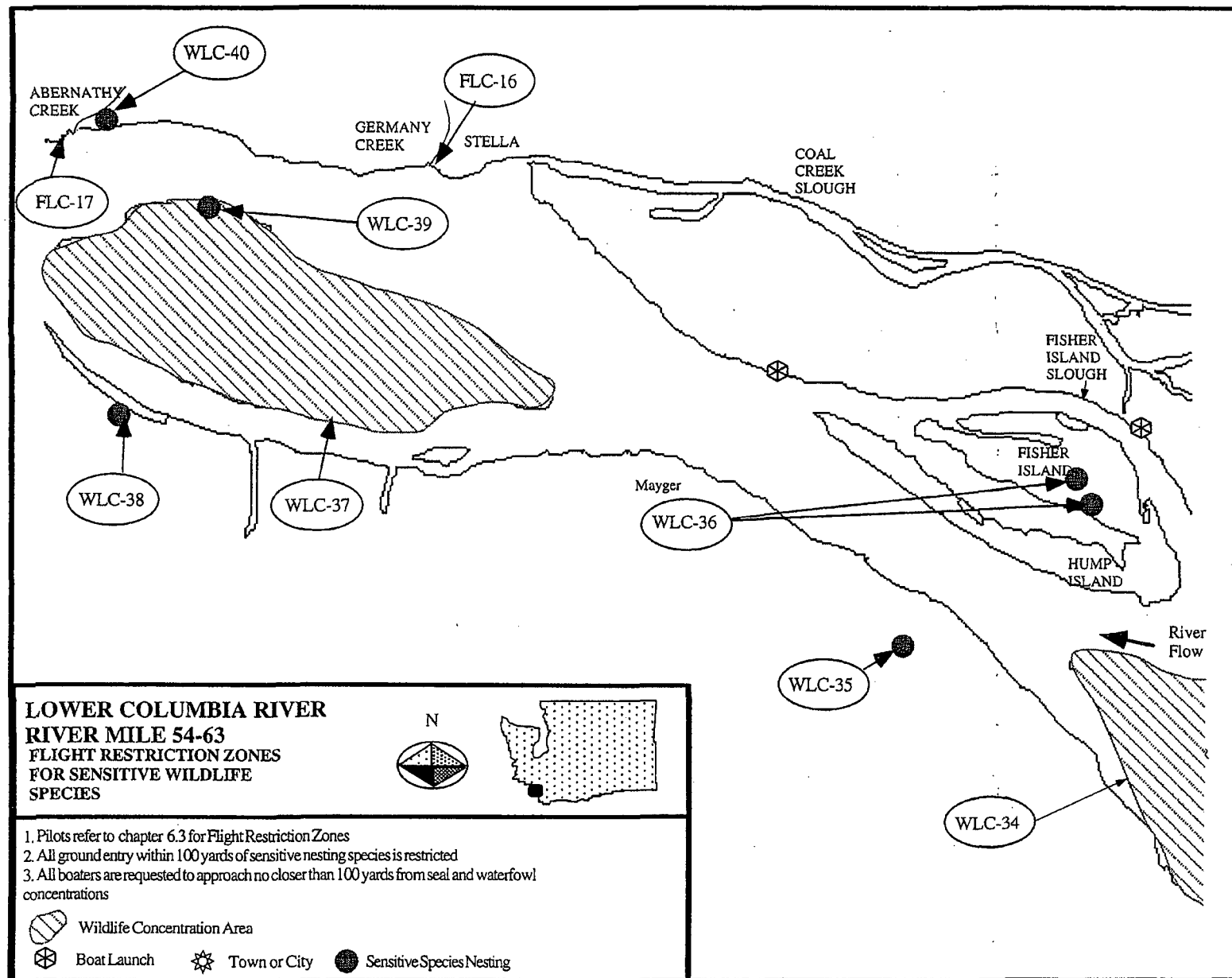
# **LOWER COLUMBIA RIVER - RIVER MILE 63-70** **FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES**

1. Pilots refer to chapter 6.3 for Flight Restriction Zones
2. All ground entry within 100 yards of sensitive nesting species is restricted
3. All boaters are requested to approach no closer than 100 yards from seal and waterfowl concentrations



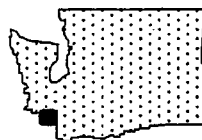
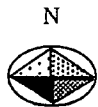
LOWER COLUMBIA RIVER WILDLIFE RESOURCES																				
River Mile 54-63										PERIOD OF SENSITIVITY										
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
WLC-34	Lord Island			Yes				Yes												
WLC-35	Oregon shore near Walker Island					Yes		Yes												
WLC-36	Fisher Island					Yes		Yes												
WLC-37	Crims Island			Yes		Yes		Yes												
WLC-38	Bradbury Slough					Yes		Yes												
WLC-39	Gull Island					Yes		Yes												
WLC-40	Abernathy Creek					Yes		Yes												
LOWER COLUMBIA RIVER FISHERY RESOURCES																				
River Mile 54-63										PERIOD OF SENSITIVITY										
Code	Location	Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
FLC-16	Germany Creek	D				H	D													
FLC-17	Abernathy Creek	D				H	D													
<div>* FLIGHT AND GROUND ENTRY RESTRICTIONS</div> <div> Flights below 1000 feet require clearance</div> <div> Sensitive season - Minimize seasonal disturbance</div>										<div>FISH STOCK STATUS</div> <div>C - CRITICAL</div> <div>D - DEPRESSED</div> <div>H - HEALTHY</div> <div>U - UNKNOWN</div>										





LOWER COLUMBIA RIVER WILDLIFE RESOURCES																					
River Mile 47-54																					
		Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion													
Code	Location								Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
WLC-41	Wallace Island					Yes		Yes													
WLC-42	Wallace Island Complex					Yes		Yes													
LOWER COLUMBIA RIVER FISHERY RESOURCES																					
River Mile 47-54																					
		Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
FLC-18	Mill Creek	D				H	D														
<div> <div>* FLIGHT AND GROUND ENTRY RESTRICTIONS</div> <div> <div></div> <div>Flights below 1000 feet require clearance</div> </div> <div> <div></div> <div>Sensitive season - Minimize seasonal disturbance</div> </div> </div>										<div> <div>FISH STOCK STATUS</div> <div> <div>C - CRITICAL</div> <div>D - DEPRESSED</div> <div>H - HEALTHY</div> <div>U - UNKNOWN</div> </div> </div>											

**LOWER COLUMBIA RIVER  
RIVER MILE 47-54  
FLIGHT RESTRICTION ZONES  
FOR SENSITIVE WILDLIFE  
SPECIES**



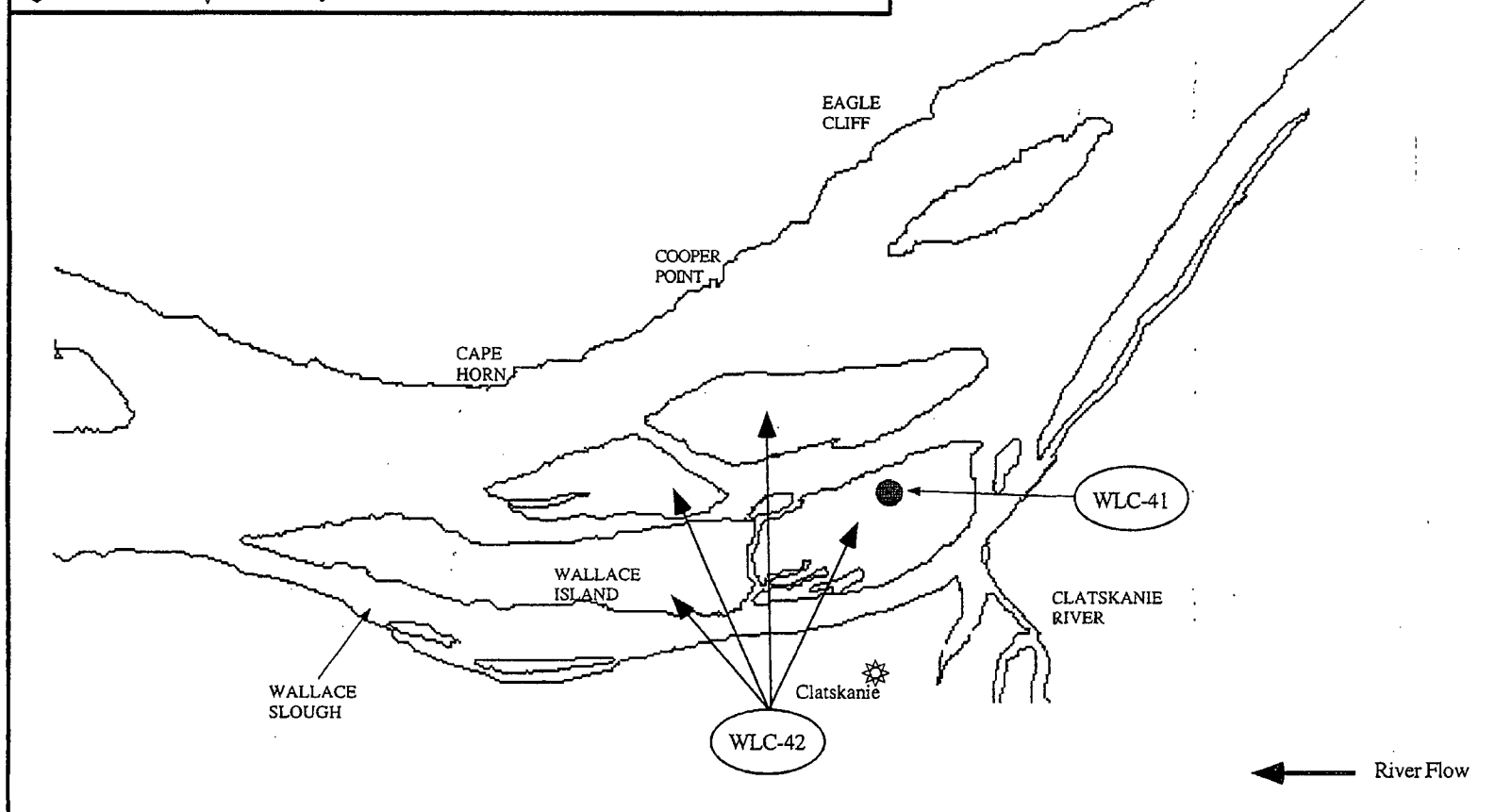
1. Pilots refer to chapter 6.3 for Flight Restriction Zones
2. All ground entry within 100 yards of sensitive nesting species is restricted
3. All boaters are requested to approach no closer than 100 yards from seal and waterfowl concentrations

● Sensitive Species Nesting

▨ Wildlife Concentration Area

⊕ Boat Launch

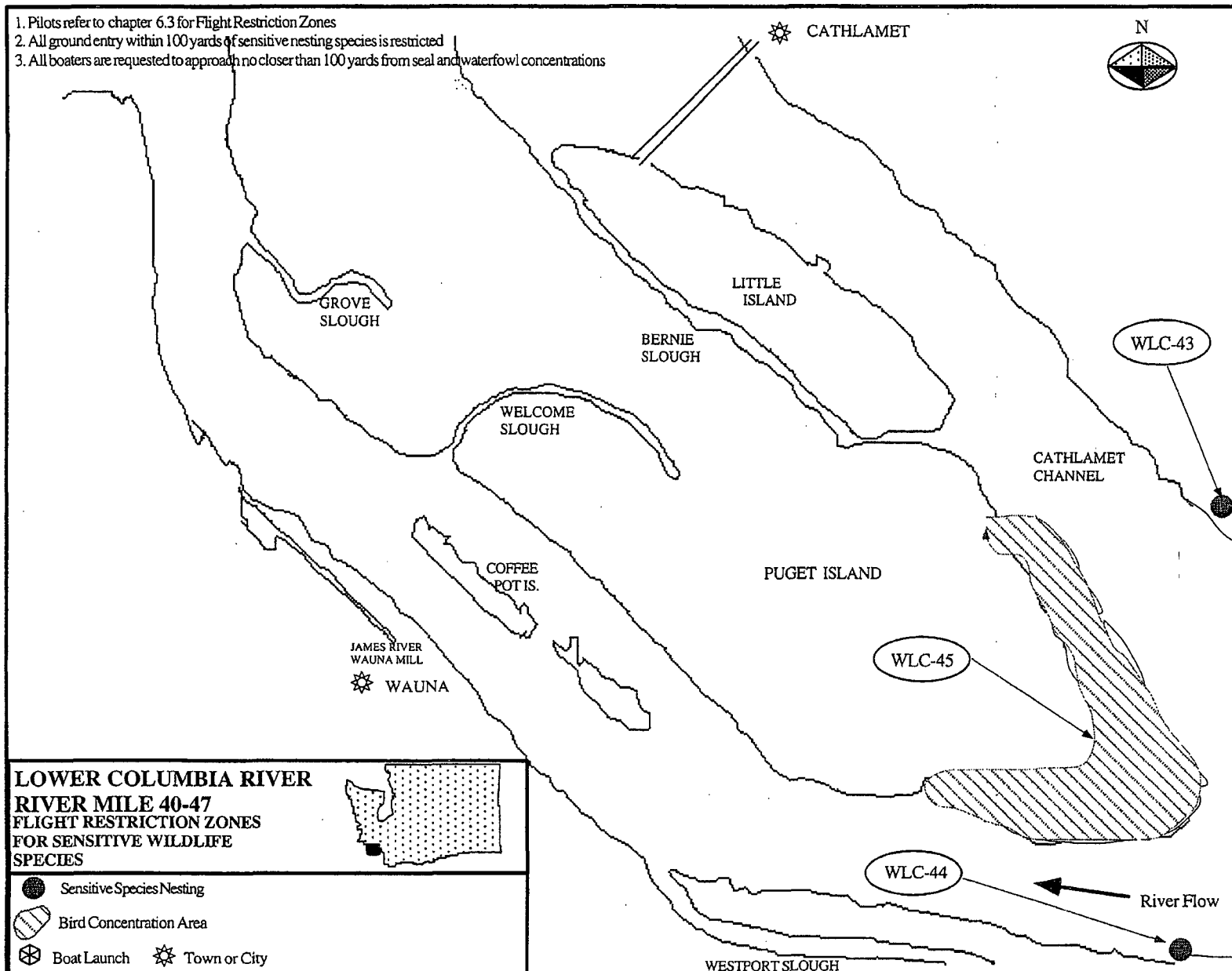
★ Town or City



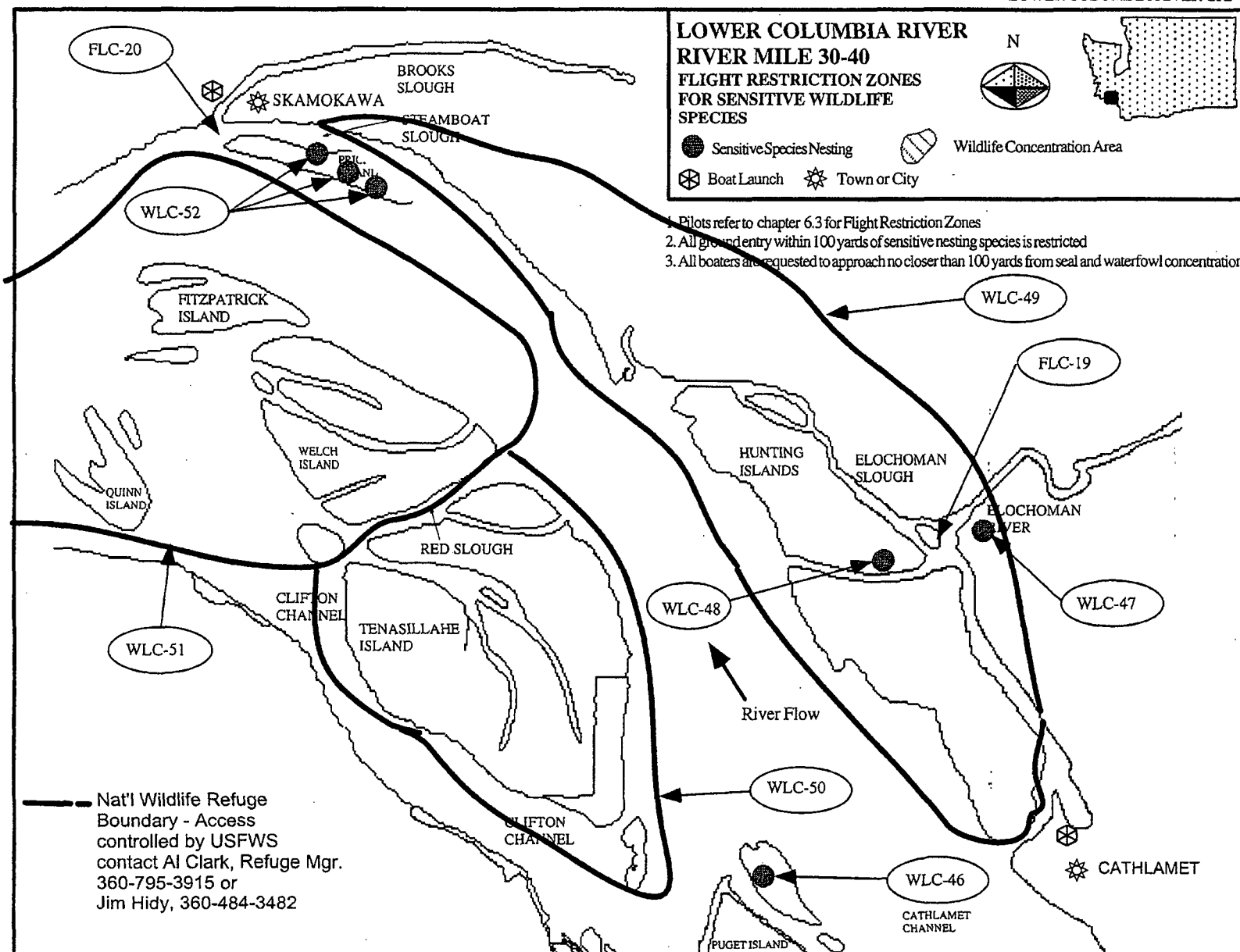
LOWER COLUMBIA RIVER WILDLIFE RESOURCES																						
River Mile 40-47													PERIOD OF SENSITIVITY									
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
WLC-43	Nassa Point					Yes		Yes														
WLC-44	Oregon shore south of Puget Island					Yes		Yes														
WLC-45	Puget Island					Yes		Yes														
<div> <div>* FLIGHT AND GROUND ENTRY RESTRICTIONS</div> <div> <div></div> <div>Flights below 1000 feet require clearance</div> </div> <div> <div></div> <div>Sensitive season - Minimize overflight disturbance</div> </div> </div>																						



1. Pilots refer to chapter 6.3 for Flight Restriction Zones
2. All ground entry within 100 yards of sensitive nesting species is restricted
3. All boaters are requested to approach no closer than 100 yards from seal and waterfowl concentrations

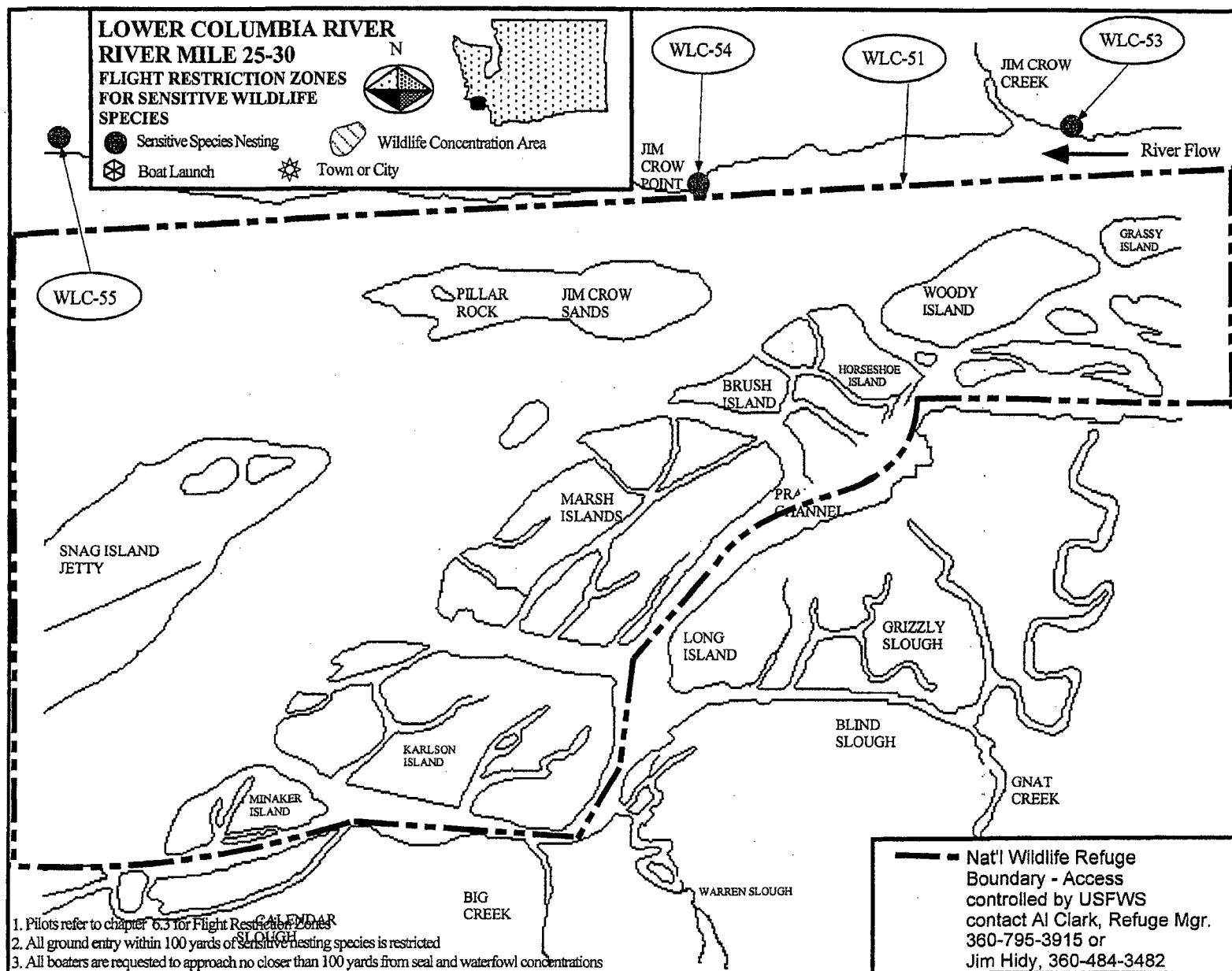


LOWER COLUMBIA RIVER WILDLIFE RESOURCES																									
River Mile 30-40												PERIOD OF SENSITIVITY													
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
WLC-46	Ryan Island					Yes		Yes																	
WLC-47	Elochoman River					Yes		Yes																	
WLC-48	Hunting Island					Yes		Yes																	
WLC-49	Julia Butler Hanson NWR			Yes				Yes																	
WLC-50	Columbia Whitetail Deer NWR			Yes				Yes																	
WLC-51	Lewis and Clark NWR			Yes				Yes																	
WLC-52	Price Island					Yes		Yes																	
LOWER COLUMBIA RIVER FISHERY RESOURCES																									
River Mile 30-40												PERIOD OF SENSITIVITY													
Code	Location	Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
FLC-19	Elochoman River	D				H	D																		
FLC-20	Skamokawa Creek	U				H	D																		
* FLIGHT AND GROUND ENTRY RESTRICTIONS										FISH STOCK STATUS															
<div>Flights below 1000 feet require clearance</div> <div>Nat'l Wildlife Refuge - Access restricted - contact Al Clark - 360-795-3915</div> <div>Sensitive season - Minimize seasonal disturbance</div>										C - CRITICAL															
										D - DEPRESSED															
										H - HEALTHY															
										U - UNKNOWN															



LOWER COLUMBIA RIVER WILDLIFE RESOURCES																						
River Mile 25-30																						
		PERIOD OF SENSITIVITY																				
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
WLC-51	Lewis and Clark NWR			Yes	Yes		Yes	Yes														
WLC-53	Jim Crow Creek					Yes		Yes														
WLC-54	Jim Crow Point					Yes		Yes														
WLC-55	Dahlia					Yes		Yes														
<div> <p>* FLIGHT AND GROUND ENTRY RESTRICTIONS</p> <p>Flights below 1000 feet require clearance</p> <p>Nat'l Wildlife Refuge - Access restricted - contact Al Clark - 360-795-3915</p> <p>Sensitive season - Minimize overflight disturbance</p> </div>																						





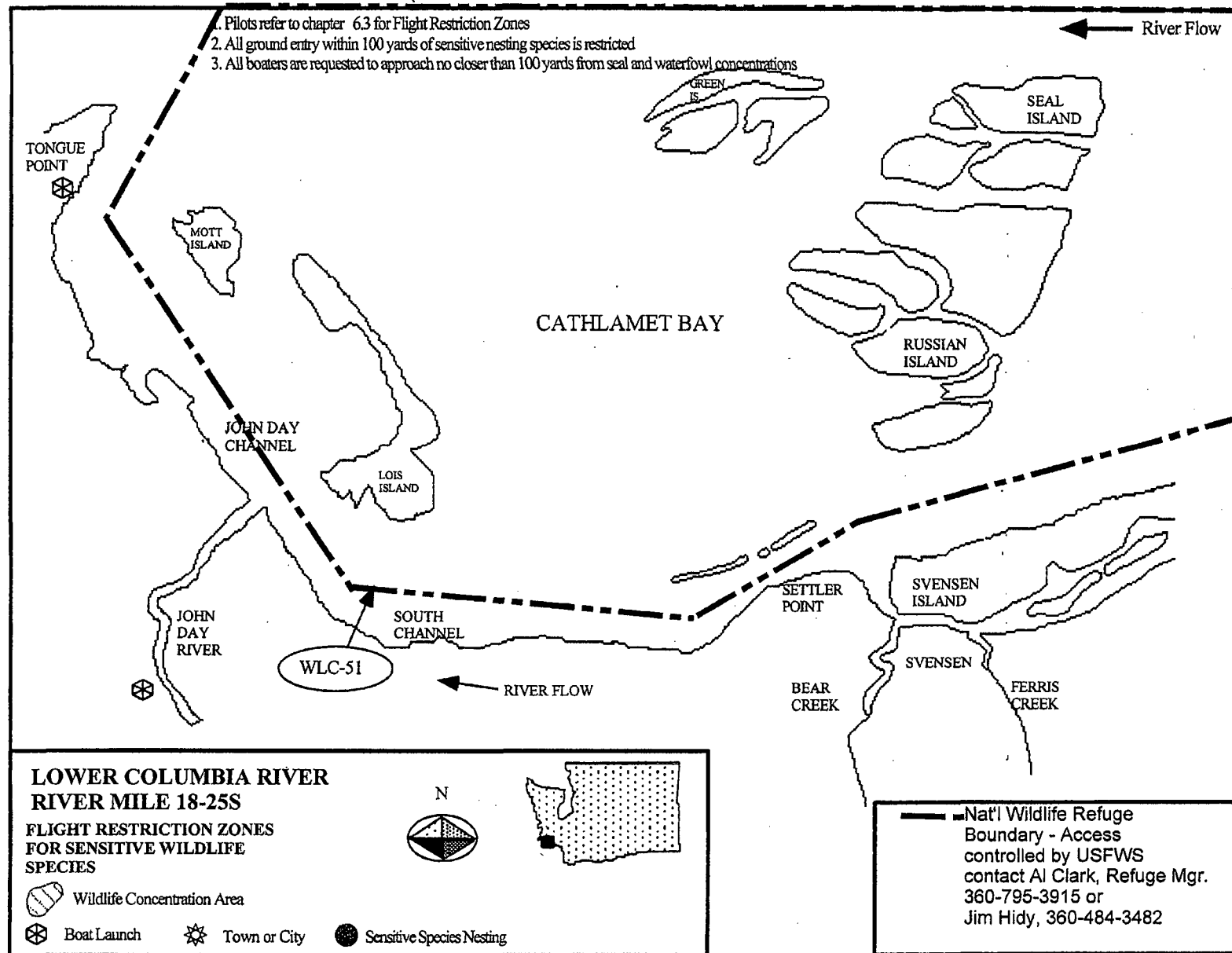
LOWER COLUMBIA RIVER WILDLIFE RESOURCES																							
River Mile 18-25S												PERIOD OF SENSITIVITY											
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
WLC-51	Lewis and Clark NWR			Yes	Yes		Yes	Yes															

\* FLIGHT AND GROUND ENTRY RESTRICTIONS

Flights below 1000 feet require clearance

Nat'l Wildlife Refuge - Access restricted - contact Al Clark - 360-795-3915

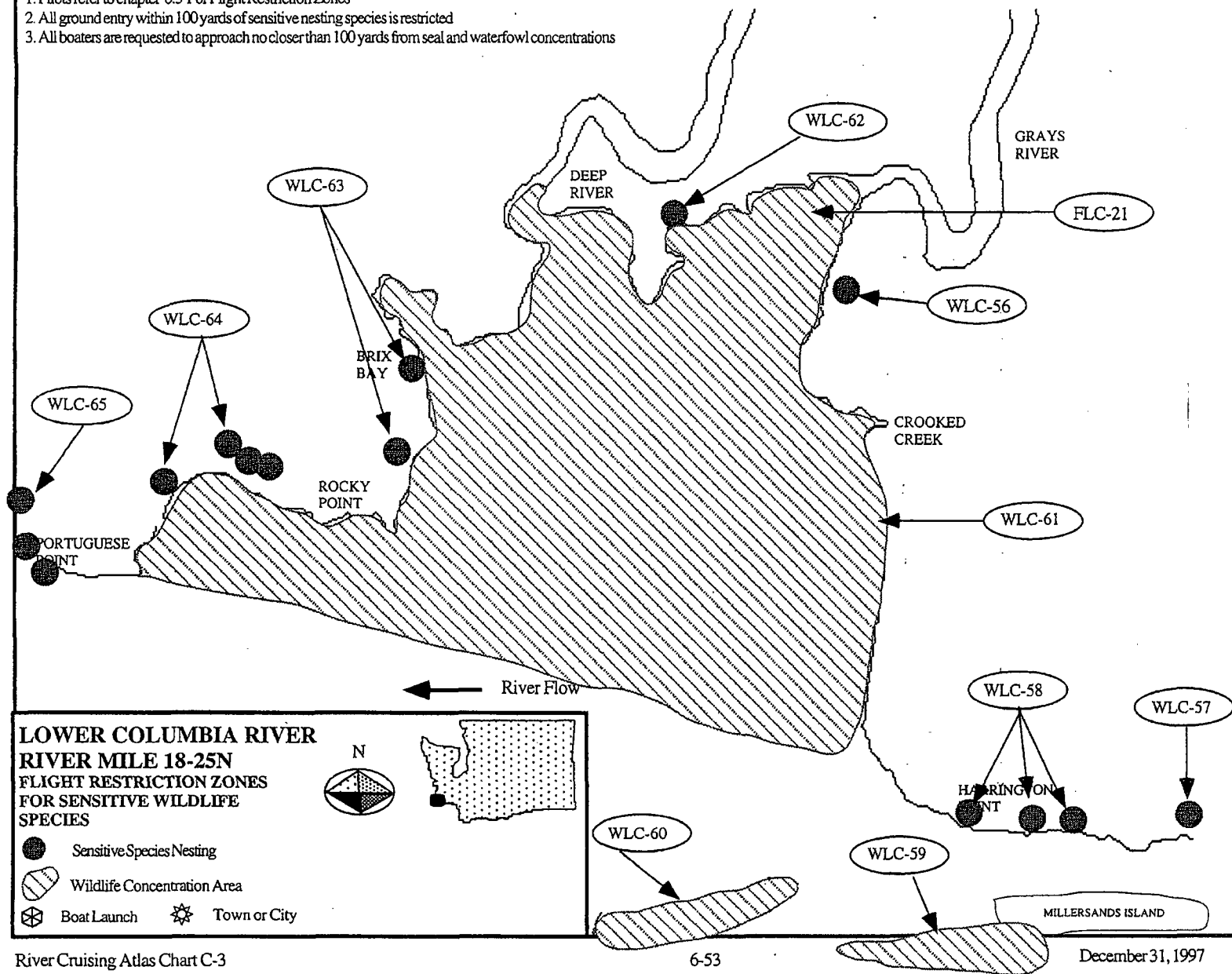
Sensitive season - Minimize overflight disturbance



LOWER COLUMBIA RIVER WILDLIFE RESOURCES																					
River Mile 18-25N										PERIOD OF SENSITIVITY											
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
WLC-56	Gray's River					Yes		Yes													
WLC-57	Harrington Point					Yes		Yes													
WLC-58	Altoona					Yes		Yes													
WLC-59	Miller Sands	Yes		Yes		Yes	Yes	Yes													
WLC-60	Rice Island	Yes		Yes				Yes													
WLC-61	Grays Bay			Yes			Yes	Yes													
WLC-62	Miller Point					Yes		Yes													
WLC-63	Brix Bay					Yes		Yes													
WLC-64	Portugese Point					Yes		Yes													
WLC-65	Grays Point					Yes		Yes													
LOWER COLUMBIA RIVER FISHERY RESOURCES																					
River Mile 18-25N										PERIOD OF SENSITIVITY											
Code	Location	Winter Steelhead	Summer Steelhead	Spring Chinook	Summer Chinook	Fall Chinook	Coho Salmon	Chum Salmon	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
FLC-21	Gray's River	D				H	D	D													
<div>* FLIGHT AND GROUND ENTRY RESTRICTIONS</div> <div><div></div>Flights below 1000 feet require clearance</div> <div><div></div>Sensitive season - Minimize seasonal disturbance</div>										FISH STOCK STATUS : C - CRITICAL D - DEPRESSED H - HEALTHY U - UNKNOWN											



1. Pilots refer to chapter 6.3 For Flight Restriction Zones
2. All ground entry within 100 yards of sensitive nesting species is restricted
3. All boaters are requested to approach no closer than 100 yards from seal and waterfowl concentrations







LOWER COLUMBIA RIVER WILDLIFE RESOURCES																						
River Mile 0-18N																						
		PERIOD OF SENSITIVITY																				
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
WLC-66	Cliff Point					Yes		Yes														
WLC-67	Megler					Yes		Yes														
WLC-68	Scarboro Point					Yes		Yes														
WLC-69	Sand Island	Yes						Yes														
WLC-70	Baker Bay			Yes			Yes	Yes														
WLC-71	Fort Canby State Park					Yes		Yes														
WLC-72	Cape Disappointment	Yes				Yes		Yes														
WLC-73	North Jetty		Yes	Yes				Yes														
WLC-74	Columbia River mouth		Yes					Yes														
<div> <div>* FLIGHT AND GROUND ENTRY RESTRICTIONS</div> <div> <div></div> <div>Flights below 1000 feet require clearance</div> </div> <div> <div></div> <div>Sensitive season - Minimize overflight disturbance</div> </div> </div>																						

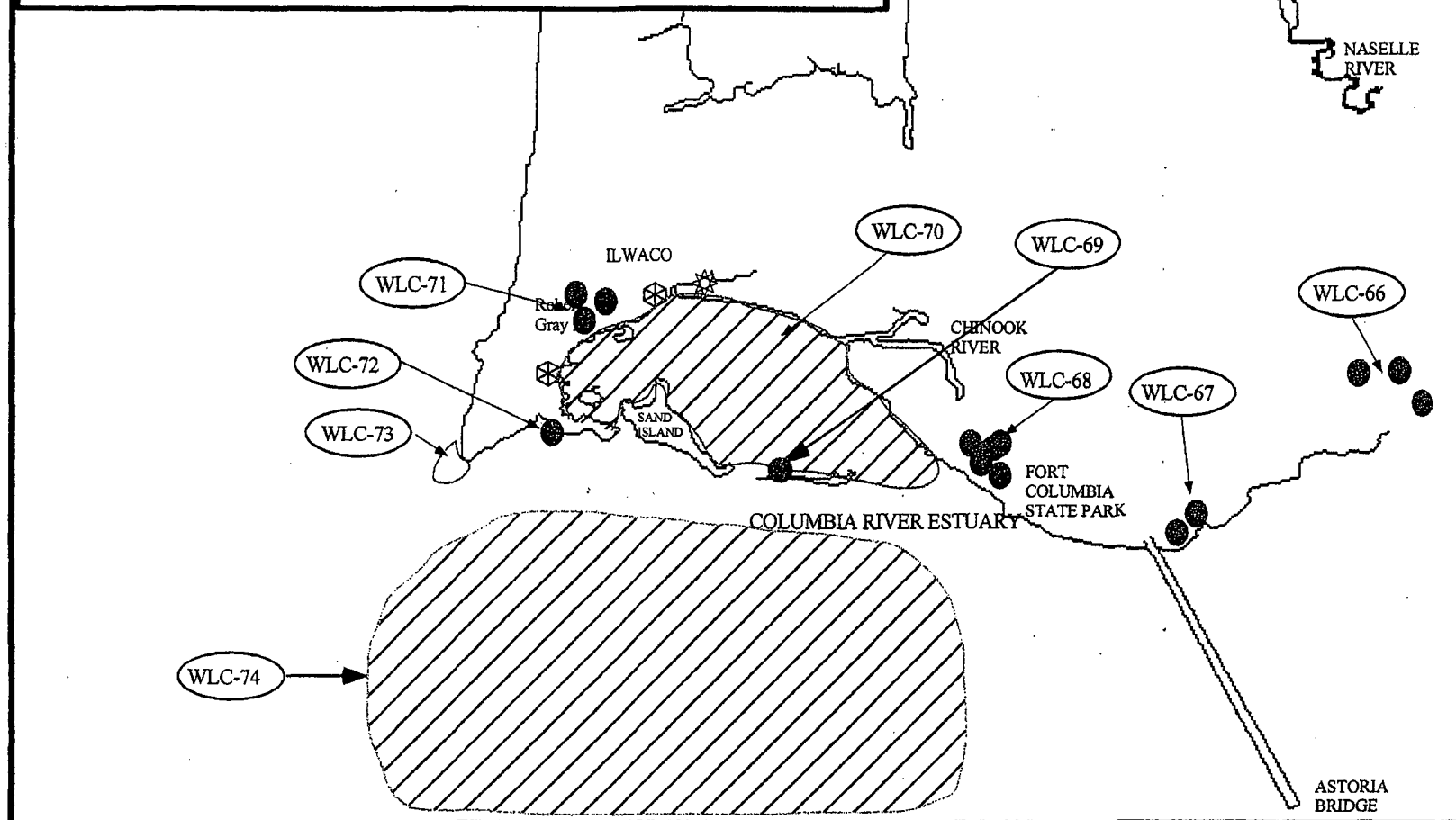
# LOWER COLUMBIA RIVER



## RIVER MILE 0-18N

### FLIGHT RESTRICTION ZONES FOR SENSITIVE WILDLIFE SPECIES

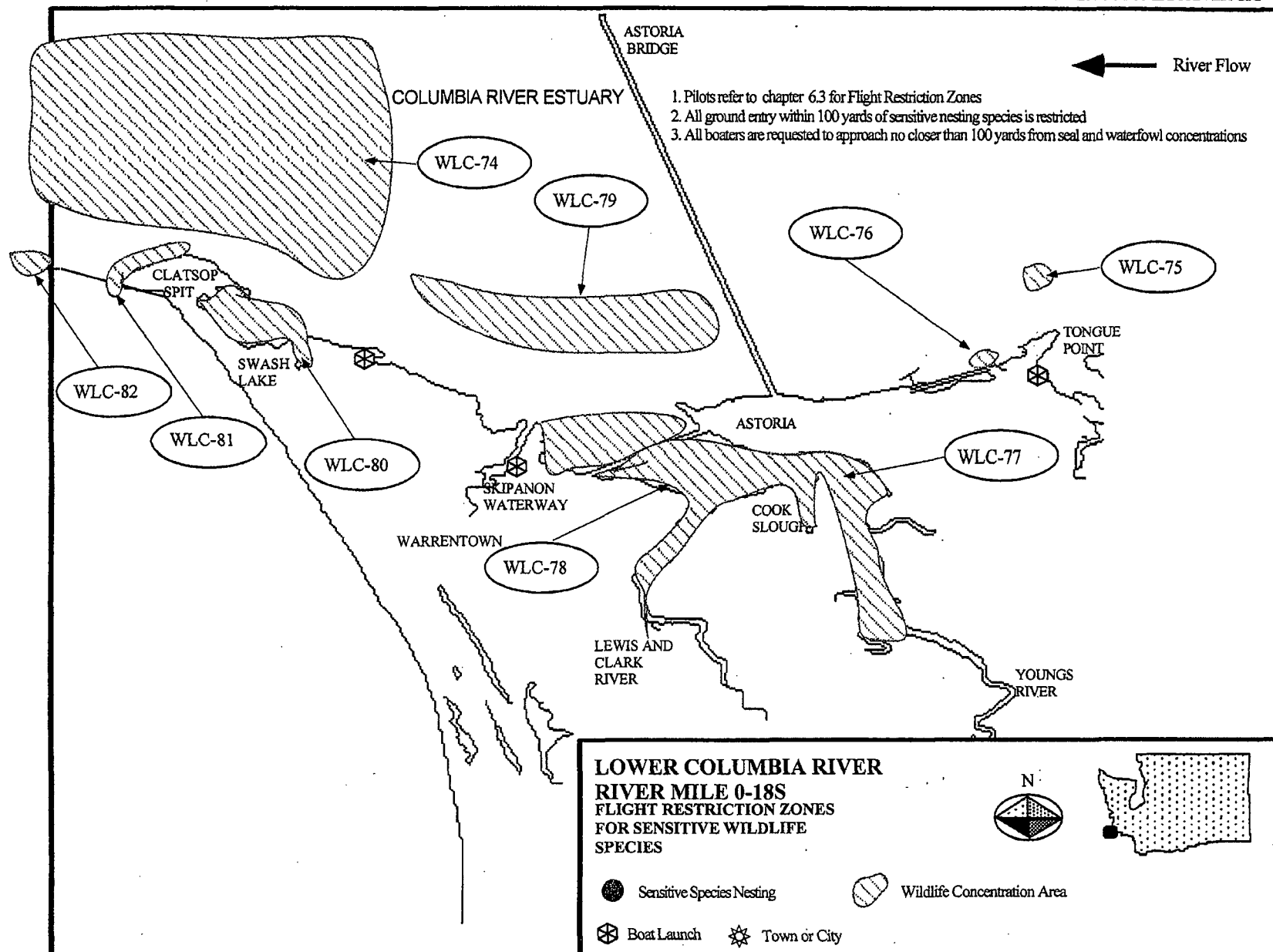
1. Pilots refer to chapter 6.3 Flight Restriction Zones
2. All ground entry within 100 yards of sensitive nesting species is restricted
3. All boaters are requested to approach no closer than 100 yards from seal and waterfowl concentrations

 Boat Launch
  Town or City
  Sensitive Species Nesting
  Wildlife Concentration Area



LOWER COLUMBIA RIVER WILDLIFE RESOURCES																							
River Mile 0-18S									PERIOD OF SENSITIVITY														
Code	Location	Seabird Colony	Seabird Conc	Waterfowl Conc	Marine Mammal Haulout	Sensitive Nesting Species	Shorebird Conc	Flight Exclusion	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec			
WLC-74	Columbia River mouth		Yes					Yes															
WLC-75	Tongue Point				Yes																		
WLC-76	City Harbor				Yes																		
WLC-77	Young's River			Yes				Yes															
WLC-78	Young's Bay			Yes				Yes															
WLC-79	Desdemona Sands				Yes																		
WLC-80	Siwash Lake and Jetty Lagoon			Yes				Yes															
WLC-81	Clatsop Spit			Yes				Yes															
WLC-82	South Jetty			Yes				Yes															
<div> <p>* FLIGHT AND GROUND ENTRY RESTRICTIONS</p> <p> Flights below 1000 feet require clearance</p> <p> Sensitive season - Minimize overflight disturbance</p> </div>																							





## 7. Logistical Information

The following is not a complete list of logistical resources - for more information please refer to the Area Contingency Plan, Summary of Area Resources Chapter 6. The subject headings which have an asterisk (\*) are being developed; please consult local DEM officials (phone numbers listed in the ACP) for specific information.

To submit data for this section, please use Comments/ Corrections/ Suggestions (Appendix C).

### 7.1 Logistical Support

The following list was compiled at the Lower Columbia River Geographic Response Plan Workshop held in Lower Columbia River on February 18, 1993. Areas of information include: command posts; communications; equipment cache locations; inventory of local support equipment; air support; access points to the Bay; and other pertinent logistical support.

Subject	Name	Characteristics	Contact	Phone #
Command Posts				
	Large Local Motels	Meeting rooms available	Chambers of Commerce	
	County Fairgrounds	Good option for wildlife rehab operation; good for upriver spills		
	Tongue Point	Excellent water access, staging, security	Job Corps	
	Port of Astoria	Small space available for forward command post	Port Offices	
	PGE Beaver Facility	Helicopter landing pad; empty storage tanks available for interim storage	Chuck Carlson	
	Port of Ilwaco	Good forward command post. Limited office, but good for trailers. Ramp; helo access		
	Camp Rilea	Enormous National Guard Facility, with storage, berthing, security, air traffic control, messing	Oregon National Guard	

Subject	Name	Characteristics	Contact	Phone #
	Frenchman's Bar Riverfront Park	6508 Lower River Rd. -- Good field command post site with significant space for trailers	Clark County Parks	
<b>Communications</b>				
<b>See NWACP, Chapter 6</b>				
<b>Equipment Cache Locations</b>				
	Astoria	MSRC  Clean Rivers/MFSA  Foss	Barry Kevan-Everett, WA  Brent Way  Tim Archer	(425) 304-1526 (503) 220-2040 (503) 978-7272
	Cathlamet	Clean Rivers/ MFSA	Brent Way	(503) 220-2040
	Skamakowa	Clean Rivers/ MFSA	Brent Way	(503) 220-2040
	Stella	Clean Rivers/ MFSA	Brent Way	(503) 220-2040
	Longview	Cowlitz Clean Sweep	Bob Matson	(503) 965-6165
	Wauna	Clean Rivers/ MFSA	Brent Way	(503) 220-2040
	Rainier	Clean Rivers/ MFSA  Foss	Brent Way  Tim Archer	(503) 228-4361 (503) 978-7272
	Portland	Clean Rivers/ MFSA  Foss  Tidewater	Brent Way  Tim Archer  Holly Robinson	(503) 220-2040 (503) 978-7272 (360) 693-1491
<b>Also see NWACP, Chapter 6</b>				
<b>Inventory of Local Support Equipment</b>				
<b>Helicopter Support/Air Support</b>				
<b>Access Points</b>				
	Aldrich Point	Concrete		
	Boardman Park	Concrete		
	Celilo Park	Asphalt		
	Coverts Landing	Concrete		
	Dalton Point	Asphalt		

Subject	Name	Characteristics	Contact	Phone #
	East Mooring Basin	Concrete		
	Giles French Park	Concrete		
	Fort Canby Park	Concrete		
	Hammond Mooring Basin	Asphalt		
	Harbor 1	Hoist		
	Hood River	Concrete		
	Irrigon Marina Park	Concrete		
	Jantzen Beach	Asphalt		
	James Gleason Ramp	Concrete		
	Mayer State Park	Concrete		
	Pier 99 Marine Center	Hoist		
	Port of Arlington	Concrete		
	Cascade Locks	Asphalt		
	Port of Dalles	Concrete		
	Quesnel Park	Concrete		
	Rainier Marina	Asphalt		
	Rooster Rock State Park	Asphalt		
	Goble Landing	Concrete		
	St. Helens Marina	Asphalt		
	Sundance Moorage	Hoist		
	Sundial	Asphalt		
	Tongue Point	Concrete		
	Umatilla Marina	Concrete		
	Westport Ramp	Concrete		
	Willow Grove Park	Concrete		
	(NOTE: Above list does not Willamette River Boat Ramps)			
Property Access Information and Contacts				
Staging Areas				
Recreational activities which could interfere				
Tribal Resources	Columbia River Inter-Tribal Fish Commission		Portland Office	(503) 238-0667
Key Local Elected Officials				
Fire Department				
Local Personnel Support				

Subject	Name	Characteristics	Contact	Phone #
<b>Volunteers</b>				
<b>Wildlife Rehab facilities</b>				
<b>Marinas/Port docks</b>				
<b>Housing/ feeding/ support</b>				
<b>Interim storage/permits</b>				
<b>Fishing fleets &amp; affiliated organizations*</b>				
<b>Boat cleaning capability*</b>				
<b>Safe havens</b>				



## APPENDICES

## Appendix A: Summary of Protection Techniques

Protection Techniques	Description	Primary Logistical Requirements	Limitations
<b>ONSHORE</b>			
<b>Beach Berms</b>	A berm is constructed along the top of the mid-inter tidal zone from sediments excavated along the downgradient side. The berm should be covered with plastic or geo-textile sheeting to minimize wave erosion.	<ul style="list-style-type: none"> <li>• Bulldozer/Motor grader -1</li> <li>• Personnel - equipment operator &amp; 1 worker</li> <li>• Misc. - plastic or geotextile sheeting</li> </ul>	<ul style="list-style-type: none"> <li>• High wave energy</li> <li>• Large tidal range</li> <li>• Strong along shore currents</li> </ul>
<b>Geotextiles</b>	A roll of geotextile, plastic sheeting, or other impermeable material is spread along the bottom of the supra-tidal zone & fastened to the underlying logs or stakes placed in the ground.	<ul style="list-style-type: none"> <li>• Geotextile - 3 m wide rolls</li> <li>• Personnel - 5</li> <li>• Misc. - stakes or tie-down cord</li> </ul>	<ul style="list-style-type: none"> <li>• Low sloped shoreline</li> <li>• High spring tides</li> <li>• Large storms</li> </ul>
<b>Sorbent Barriers</b>	A barrier is constructed by installing two parallel lines of stakes across a channel, fastening wire mesh to the stakes & filling the space between with loose sorbents.	Per 30 meters of barrier <ul style="list-style-type: none"> <li>• Wire mesh - 70 m x 2 m</li> <li>• Stakes - 20</li> <li>• Sorbents - 30 m<sup>2</sup></li> <li>• Personnel - 2</li> <li>• Misc. - fasteners, support lines, additional stakes, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Waves &gt; 25 cm</li> <li>• Currents &gt; 0.5 m/s</li> <li>• Tidal range &gt; 2 m</li> </ul>
<b>Inlet Dams</b>	A dam is constructed across the channel using local soil or beach sediments to exclude oil from entering channel.	<ul style="list-style-type: none"> <li>• Loader - 1</li> <li>• Personnel - equipment operator &amp; 1 worker or several workers w/shovels</li> </ul>	<ul style="list-style-type: none"> <li>• Waves &gt; 25 cm</li> <li>• Tidal range exceeding dam height</li> <li>• Freshwater outflow</li> </ul>

<b>NEARSHORE</b>			
<b>Containment Booming</b>	Boom is deployed in a "U" shape in front of the oncoming slick. The ends of the booms are anchored by work boats or drogues. The oil is contained within the "U" & prevented from reaching the shore.	For 150 meters Slick: <ul style="list-style-type: none"> <li>• Boom - 280 m</li> <li>• Boats - 2</li> <li>• Personnel - boat crews &amp; 4 boom tenders</li> <li>• Misc. - tow lines, drogues, connectors, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• High winds</li> <li>• Swells &gt; 2 m</li> <li>• Breaking waves &gt; 50 cm</li> <li>• Currents &gt; 1.0 m/s</li> </ul>
<b>Exclusion Booming</b>	Boom is deployed across or around sensitive areas & anchored in place. Approaching oil is deflected or contained by boom.	Per 300 meters of Boom <ul style="list-style-type: none"> <li>• Boats - 1</li> <li>• Personnel - boat crew &amp; 3 boom tenders</li> <li>• Misc.- 6 anchors, anchor line, buoys, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Currents &gt; 0.5 m/s</li> <li>• Breaking waves &gt; 50 cm</li> <li>• Water depth &gt; 20 m</li> </ul>
<b>Deflection Booming</b>	Boom is deployed from the shoreline away from the approaching slick & anchored or held in place with a work boat. Oil is deflected away from shoreline.	Single Boom, 0.75 m/s knot current <ul style="list-style-type: none"> <li>• Boom - 60 m</li> <li>• Boats - 1</li> <li>• Personnel - boat crew + 3</li> <li>• Misc. - 3 anchors, line, buoys, recovery unit</li> </ul>	<ul style="list-style-type: none"> <li>• Currents &gt; 1.0 m/s</li> <li>• Breaking waves &gt; 50 cm</li> </ul>
<b>Diversion Booming</b>	Boom is deployed from the shoreline at an angle towards the approaching slick & anchored or held in place with a work boat. Oil is diverted towards the shoreline for recovery.	Single Boom, 0.75 m/s knot current <ul style="list-style-type: none"> <li>• Boom - 60 m</li> <li>• boats - 1</li> <li>• Personnel - boat crew + 3</li> <li>• Misc. - 3 anchors, line, buoys, recovery unit</li> </ul>	<ul style="list-style-type: none"> <li>• Currents &gt; 1.0 m/s</li> <li>• Breaking waves &gt; 50 cm</li> </ul>
<b>Skimming</b>	Self-propelled skimmers work back & forth along the leading edge of a windrow to recover the oil. Booms may be deployed from the front of a skimmer in a "V" configuration to increase sweep width. Portable skimmers are placed within containment booms in the area of heaviest oil concentration.	Self-propelled (None) Towed <ul style="list-style-type: none"> <li>• Boom - 200 m</li> <li>• Boats - 2</li> <li>• Personnel - boat crews &amp; 4 boom tenders</li> <li>• Misc. - tow lines, bridles, connectors, etc.</li> </ul> Portable <ul style="list-style-type: none"> <li>• Hoses - 30 m discharge</li> <li>• Oil storage - 2000 liters</li> </ul>	<ul style="list-style-type: none"> <li>• High winds</li> <li>• Swells &gt; 2 m</li> <li>• Breaking waves &gt; 50 cm</li> <li>• Currents &gt; 1.0 m/s</li> </ul>

**Appendix B: Original Geographic Response Plan Contributors****Industry and Response Contractors**

Tim Archer, Foss Environmental  
Heather Bartlett, Simpson Paper Company  
Gary Braun, Tetra Tech Inc.  
Jeff Brooks, Riedel Environmental Services  
Mark Copeland, Clean Rivers Coop  
Kendal Couch, Marine Spill Response Corp.  
Dean Dale, Genwest Systems, Inc.  
Donald Floyd, Fred Devine Diving & Salvage  
Paul Gallagher, Foss Environmental  
Don Hall, Pac Link  
Rick Harshfield, Marine Spill Response Corp.  
Dick Heymann, Riedel Environmental Services  
Dean Lackey, Fred Devine Diving & Salvage  
Ted Leigh, Marine Spill Response Corp.  
Mike Lordos, Riedel Environmental Services  
Bob Mattson, Cowlitz Clean Sweep  
John Peterson, Riedel Environmental Services  
Chris Sherwood, Battelle Marine Sciences Lab  
Evert Smith, Brix Maritime  
Paul Stevenson, Columbia River Pilots  
Lisa Stone, Marine Spill Response Corp.  
Brent Way, Clean Rivers Coop  
Harold Zarling  
Jack Zimmerman

**Local Representatives**

Dave Glasson, City of Long Beach  
Jon Graves, CREST  
Carol Rushmore, CREST  
Darlena Wilson, Pacific Co. Emer. Management

**State Representatives - Washington****Washington State Department of Ecology**

Jeff Bash  
Don Beery  
Lin Bernhardt  
Jeannie Brandt  
Laura Geselbracht  
Shari Harris-Dunning  
Paul Heimowitz  
Eric Heinitz  
Steve Hunter  
Dick Logan  
Brett Manning  
Jim Oberlander  
Dave Rogowski

**State Representatives – Washington cont.****Washington Department of Fish & Wildlife**

Rocky Beach  
Brian Benson  
Bill Graeber  
Thom Hooper  
Steve Jeffries  
Jeff Skriletz  
Barry Troutman

**Washington Office of Marine Safety**

Joel Greene

**Washington Parks & Recreation Commission**

Mike Barber  
Larry Chapman  
Mike Ramsey

**Washington State Patrol**

Lonnie Brackins  
Robert Johnson

**State Representatives - Oregon****Oregon Economic Development Department**

Don Mann

**Oregon Department of Environmental Quality**

Rebecca DeMoss  
Elizabeth Dimmick  
Cordelia Shea  
Bruce Sutherland  
Jack Wylie  
Loren Garner

**Oregon Department of Fish & Wildlife**

Don Bennett  
Joe Pesek  
Terry Link  
Greg Robart  
Allen Taylor  
Don Vandenberg

**Oregon State Parks**

Peter Bond

**Federal Representatives**

**United States Coast Guard**

Christina Bjergo  
Mark Corcoran  
James Crawford  
Chris Curatilo  
Glenn Epler  
Rod Leland  
Rob Myles  
Daniel Neptun  
Janice Page  
Greg Schultz  
Paul Slyman

**National Oceanic and Atmospheric  
Administration**

Ken Barton  
Sharon Christopherson  
Jerry Galt  
Doug Helton  
Gary May

**U.S. Department of Interior**

Charles Polityka  
Preston Sleeper

**U.S. Fish and Wildlife Service**

Colleen Henson  
Al Clark  
Elizabeth Materna  
Carol Schuler

**National Park Service**

Curt Ahola  
Cynthia Orlando

**Appendix C: Geographic Response Plan Comments/Corrections/Suggestions**

If you have any questions regarding this document or find any errors, please notify one of the following agencies:  
or use tear out sheet (page C-3)

- Washington Department of Ecology, SPPR program, Natural Resources Unit
- USCG Marine Safety Office Puget Sound, Planning Department
- USCG Marine Safety Office Portland
- Oregon Department of Environmental Quality
- Idaho Emergency Response Commission
- Environmental Protection Agency Region 10

**Phone Numbers:**

Washington DOE	(360) 407-6972
USCG MSO Puget Sound	(206) 217-6213
USCG MSO Portland	(503) 240-9307
Oregon DEQ	(503) 229-5774
Idaho ERC	(208) 334-3263
EPA	(206) 553-6901

**Bulletin Board System (BBS):**

USCG MSO Puget Sound	(206) 217-6216
USCG MSO Portland	(503) 240-9308

**Internet/E-mail Address:**

WADOE	Dale Davis, dald461@ecy.wa.gov
OR DEQ	Jack Wylie, WYLIE.Jack@deq.state.or.us
USCG MSO Puget Sound	LT Tedd Hutley, thutley@pacnorwest.uscg.mil
USCG MSO Portland	LT Rob Walls, rwalls@pacnorwest.uscg.mil
USEPA	Beth Sheldrake, sheldrake.beth@epamail.epa.gov

**Address:**

Commanding Officer  
United States Coast Guard  
MSO Puget Sound  
Planning Department  
1519 Alaskan Way South  
Seattle, WA 98134-1192

Washington Department Of Ecology  
SPPR Program  
Natural Resources Unit  
P.O. Box 47600  
Olympia, WA 98504-7600

Office Of The Governor  
Idaho Emergency Response Commission  
1109 Main  
Statehouse  
Boise, ID 83720-7000

Commanding Officer  
United States Coast Guard  
Planning Department  
MSO Portland  
6767 North Basin Ave  
Portland, OR 97217-3992

Oregon Department of Environmental  
Quality  
Water Quality Division  
811 SW Sixth Avenue  
Portland, OR 97204

Environmental Protection Agency  
Emergency Response Branch  
1200 Sixth Avenue  
Seattle, WA 98101



#### *2.4.5 Rescue and Rehabilitation of Animal Life*

Cascade General, Inc. would consult with the Department of Environmental Quality and appropriate agencies for proper rescue and rehabilitation of animal life. While Cascade General, Inc. does not have the personnel to perform such rescue and rehabilitation, its OSRO, Clean Rivers Cooperative, Inc. does have a contract with the International Bird Rescue Research Center (IBRRC), as well as a pre-staged animal wildlife rescue trailer at its Portland facility. IBRRC will provide care with CRC for small, maximum probable, and worst case discharges according to the following guidelines.

### **IBRRC/CRC Wildlife Search, Rescue and Rehabilitation Guidelines**

#### **Small Spill**

##### **Planning Level One**

For a small spill, the number of oiled wildlife is expected to be between 1 and 10. Upon activation IBRRC will send at least one response team member to do an assessment, and initiate an appropriate response.

##### **Search and Collection Strategies**

During a small spill response, one team of two should be adequate to do both search and collection as well as stabilization of oiled wildlife. A stabilization collection site will be set-up in a trailer or cube van. This would be the Clean Rivers Cooperative trailer or van or Washington State's used under a cooperative agreement.

##### **Rehabilitation Strategies**

There are a number of possible strategies, affected by the specific location of the spill response resources, time of year, species affected, etc.

1. Set up a temporary rehabilitation facility at the Clean Rivers Cooperative Maintenance Facility in Portland. This would likely utilize a warehouse with adequate space and utilities. A mobile trailer, designed and outfitted to provide high volumes of hot water will be utilized next to the building. CRC's trailer or own owned by the WA FWS, available to Co-op members through a reciprocal agreement, would be utilized as appropriate under each situation.

2. Contract with a local rehabilitation organization to provide facilities and/or services to rehabilitate the affected wildlife. During the Texaco Fidalgo spill IBRRC contracted with HOWL Wildlife Center, Lynnwood, WA for use of a portion of the wildlife center to rehabilitate oiled wildlife. The rehabilitation was performed by IBRRC response team members. In this scenario, it is likely the IBRRC personnel would perform or supervise cleaning, rehabilitation and release depending on the experience, abilities, and willingness of the rehabilitation center staff and volunteers. IBRRC has extensive contacts with rehabilitation organizations in both Washington and Oregon.

### Disposal Strategies

In a small spill (1-20 animals) coolers with dry ice will be used to temporarily store dead oiled wildlife. Animals will be identified, logged and marked individually in accordance with guidelines from representatives of Oregon Fish and Wildlife and the USFWS. They will be disposed of in accordance with DEQ guidelines and in locations and manners that have been pre-approved by DEQ.

### Personnel

In a small spill, the personnel needs will be relatively small. It is expected that they will be met by IBRRC personnel, members of the Clean Sweep wildlife team and possibly volunteers from local rehabilitation organizations. IBRRC has five Response Team members within four hours of Portland. CRC has contracted with Clean Sweep of Longview to provide 20 wildlife responders with eight hours of IBRRC wildlife training. IBRRC has given training to more than 50 wildlife rehabilitators in Oregon. Volunteers who have not been trained will be given appropriate safety training prior to working and on-the-job supervision throughout the response.

### Equipment

CRC/IBRRC have stockpiled search and collection stabilization supplies needed for the first 48 hours of a spill of this size. Equipment and supplies for the first 24 hours at this planning level shall be stockpiled within the area covered by the Plan. Other equipment will be capable of being on sit 16 hours after mobilization. Rehabilitation equipment and supplies that are not readily available will be identified and either stockpiled or agreements will be obtained to assure their availability within 48 hours of activation of the system.

## **Maximum Probable Spill**

### Planning Level 2.

For a maximum probable spill, the number of oiled wildlife is expected to be between 11-50.

Upon activation, IBRRC will send at least one response team member to do an assessment, and initiate an appropriate response.

### Search and Collection Strategies

In the 11-50 animal scenario, one or two teams of w\two should be adequate to do search and collection. Additionally one to two people will be needed for stabilization. A stabilization collection site will be set-up in a trailer or cube van. This would be the CRC trailer or van or Washington State's, used under a cooperative agreement.

### Rehabilitation Strategies

There are several possible strategies. These will be affected by the specific location of the spill, responsible party resources, time of year, species affected. They include:

1. Set up a temporary rehabilitation facility at the CRC Maintenance Facility in Portland. This building provides approximately 6,000 sq. ft. of warehouse space and utilities. A mobile trailer, designed and outfitted to provide high volumes of hot water will be utilized next to the

building. CRC's trailer, or one owned by the WA Dept FW and available to Co-op members through a reciprocal agreement, would be utilized as appropriate under each situation.

2. Contract with a local rehabilitation organization to provide facilities and/or services to rehabilitate the affected wildlife. During the Texaco Fidalgo spill, IBRRC contracted with HOWL Wildlife Center, Lynnwood, WA for use of a portion of the wildlife center to rehabilitate oiled wildlife. The rehabilitation was performed by IBRRC response team members. In this scenario, it is likely the IBRRC personnel would perform or supervise cleaning, rehabilitation and release depending on the experience, abilities, and willingness of the rehabilitation center staff and volunteers. IBRRC has extensive contacts with rehabilitation organizations in both Washington and Oregon.

3. Activation of the St. Edward's State Park facility through a cooperative agreement with the State of Washington. This option would probably not be utilized unless there was the possibility of the spill developing to Planning Level 3.

#### Disposal Strategies

In a medium (maximum probable) spill (11-50 animals), coolers with dry ice will be used to temporarily store dead oiled wildlife. If needed a freezer will be rented and set up near the stabilization site. Animals will be identified, logged and marked individually in accordance with guidelines from representatives of Oregon Fish and Wildlife and the USFWS. They will be disposed of in accordance with DEQ guidelines and in locations and manners that have been pre-approved by DEQ.

#### Personnel

In a maximum probable spill, the personnel needs are expected to be 12-25 people. They will be met by IBRRC personnel, members of the Clean Sweep wildlife team and possibly volunteers from local rehabilitation organizations. IBRRC has five Response Team members within four hours of Portland. CRC has contracted with Clean Sweep of Longview to provide 20 wildlife responders with eight hours of IBRRC wildlife training. IBRRC has given training to more than 50 wildlife rehabilitators in Oregon. Volunteers who have not been trained will be given appropriate safety training prior to working and on-the-job supervision throughout the response.

#### Equipment/Supplies

CRC/IBRRC have stockpiled search and collection stabilization supplies needed for the first 48 hours of a spill of this size. Equipment and supplies for the first 24 hours at this planning level shall be stockpiled within the area covered by the Plan. Other equipment will be capable of being on sit 16 hours after mobilization. Rehabilitation equipment and supplies that are not readily available will be identified and either stockpiled or agreements will be obtained to assure their availability within 48 hours of activation of the system.

## **Worst Case Spill**

### Planning Level Three

For a worst case spill, the number of oiled wildlife is expected to be between 50 and 1,000. Upon activation, IBRRC will send at least one response team member to do an assessment and initiate an appropriate response.

### Search and Collection Strategies

In a worst case spill (50+ animals), 2-15 teams of 2-3 should be adequate to do search and collection. Additionally 4-10 (or more) individuals will be needed for stabilization. It is likely that multiple stabilization sites will be necessary. Sites for stabilization will be identified by the Search and Collection Supervisor. Teams will work out of a field command center, will receive daily briefings, and be assigned to specific areas to search. Daily search plans will be formulated by the Search and Collection Supervisor who will communicate with unified command through IBRRC's Director of the Response. Search plans will consider topography, weather, species affected, tides and previous days reports.

### Rehabilitation Strategies

There are several possible strategies. These will be affected by the specific location of the spill, responsible party resources, time of year, species affected. These include:

1. Activation of the St. Edward's State Park facility through a cooperative agreement with the State of Washington.
2. Set up a temporary rehabilitation facility close to the spill area or in Portland/Vancouver area. This would likely utilize a warehouse with adequate space and utilities. Water for cleaning would likely be supplied by use of the state of Washington's mobile trailer, designed and outfitted to provide high volumes of hot water, which would be moved to the site. This trailer is available to CRC members through a cooperative agreement. Potential sites will be pre-identified by CRC and IBRRC. One site already identified is the gymnasium at the Port of Longview.

### Disposal Strategies

In a worst case spill (50+ animals) coolers with dry ice will be used to temporarily store dead oiled wildlife. As needed, a freezer will be rented and set up near the stabilization site. Animals will be identified, logged and marked individually in accordance with guidelines from representatives of Oregon Fish and Wildlife and the USFWS. They will be disposed of in accordance with DEQ guidelines and in locations and manners that have been pre-approved by DEQ.

### Personnel

In a 50+ animal spill, the personnel needs could be expected to be 15 people per day and up. They will be met by IBRRC personnel, organized volunteers personnel, and possibly volunteers from local rehabilitation organizations. IBRRC has provided CRC with a callout list to activate IBRRC. IBRRC has five Response Team members within four hours of Portland. CRC has contracted with Clean Sweep of Longview to provide 20 wildlife responders with eight hours of IBRRC wildlife training. IBRRC has given training to more than 50 wildlife rehabilitators in

Oregon. Volunteers who have not been trained will be given appropriate safety training prior to working and on-the-job supervision throughout the response.

#### Equipment/Supplies

CRC/IBRRC have stockpiled search and collection stabilization supplies needed for the first 48 hours of a spill of this size. Equipment and supplies for the first 24 hours at this planning level shall be stockpiled within the area covered by the Plan. Other equipment will be capable of being on sit 16 hours after mobilization. Rehabilitation equipment and supplies that are not readily available will be identified and either stockpiled or agreements will be obtained to assure their availability within 48 hours of activation of the system. CRC/IBRRC will make cooperative agreements to obtain equipment expected to be necessary for search and collection and stabilization in the first 72 hours of a spill of up to 1,500 birds.

#### *2.4.6 Measures to Minimize Damage Onshore During Cleanup Activities*

Cascade General, Inc., through planning in conjunction with the appropriate agencies, would:

- Determine what areas may be jeopardized by cleanup activities
- Develop an on-site protection plan
- Use barrier tape to prevent unwarranted passage through unaffected areas
- Direct personnel to avoid certain areas and/or types of cleanup activities.

#### *2.5 Disposal Plans – 40 CFR Part 112 Appendix G Section 1.7.2*

The state is responsible for making decisions regarding debris disposal in the event of a spill. Decisions on disposal method(s) are on a case-by-case basis by the Oregon Department of Environmental Quality regional responder. Contact with the DEQ's regional responder and with other state or federal agencies during spill response and cleanup can be made through the Oregon Emergency Response System (OERS) at 1-800-452-0311.

The facility maintains a hazardous waste storage area for handling oily debris and waste oil from vessel cleanup during ship repair operations. This area could be used during an oil spill incident for logistical purposes.

Any site used by Cascade General, Inc., for interim storage must meet state minimum criteria for waste storage, unless specifically exempted for a spill event. The site should be chosen, however, to minimize further damage to the environment, having such elements as impervious surfaces, a bermed perimeter, sealed drains or non-drainage area.

#### *2.5.1 Storage of Reclaimed Oil and Oily Debris*

Recovered oil will typically contain large amounts of water and debris, which should be removed prior to treatment. Excess water increases the volume of waste to be transported and can cause problems at disposal facilities. The Ballast Water Treatment Plant (BWTP) can be utilized for oil/water separation. The BWTP has a total capacity of 150,000 barrels. Approximately 26,000 barrels of oil/water storage is available on a daily basis which could be used in the event of a spill. Oiled debris will be removed prior to treatment in the BWTP.

Oil and water recovered from the release will be stored in available tanks within the BWTP. Sealable containers such as 55-gallon drums, portable pillow tanks, empty fuel storage tanks,



tank trucks, and barges, are also available for storing recovered oil and water. Oiled debris will be stored in leak proof containers or on an impermeable barrier to prevent migration to the soil.

#### *2.5.2 Recycling and Disposal Plan*

Materials generated during the response and cleanup of an oil spill will be transported to an appropriate facility for recycling, treatment, or disposal. Oily waste will be managed in accordance with the DEQ guidelines specified in the Oiled Debris Disposal Plan. Recycling or reuse is the preferred method for handling the materials generated during response and cleanup of an oil spill.

The following table summarizes facilities capable of accepting waste for recycling, treatment, or disposal:

Waste	Hillsboro Landfill	PSC Environmental Services	Fuel Processors
Recovered Product		X	X
Contaminated Soil	X	X	
Contaminated Drums, Tanks, Shovels, etc	X	X	
Personal Protective Equipment	X	X	
Adsorbent and Spent Chemicals		X	
Decontamination Solutions		X	

#### **Waste Disposal Options**

PSC Environmental Services  
625 South 32<sup>nd</sup> St.  
Washougal, WA 98671  
(800) 547-2436

PSC Environmental Services  
20245 77<sup>th</sup> Ave. S.  
Kent, WA 98032  
(235) 872-8030

Fuel Processors  
Portland, Oregon  
(503) 286-8352

Hillsboro Landfill in Hillsboro, Oregon accepts non-hazardous waste including soil and oily debris generated during any cleanup activities. Materials can contain up to 50,000 parts per million (ppm) diesel or heavy oil. Laboratory analyses of the wastes would most likely be required to characterize materials. A Generator's Special Waste Profile Sheet is prepared by the generator and approved prior to disposal at Hillsboro. Hillsboro Landfill general information is as follows:

Hillsboro Landfill, Inc.  
3205 SE Minter Bridge Road  
Hillsboro, Oregon 97123  
(503) 640-9427

Non-recyclable waste or treatment residues characterized as dangerous or hazardous wastes will be transported to a RCRA Subtitle C landfill. Arlington Landfill in Arlington, Oregon, is a permitted RCRA Subtitle C hazardous waste landfill. Chemical Waste Management operates it. Contaminated debris would be transported by truck or rail to Arlington for disposal. Testing of the materials would be required by landfill operators before receiving the waste. General information for Arlington Landfill is as follows:

Chemical Waste Management  
17629 Cedar Springs Lane  
Arlington, Oregon 97812  
(541) 454-2030

## ***2.6 Evacuation Plan***

The Portland Shipyard is a multiple use facility consisting of Cascade General, Specialty Finishes, Vigor Marine, Shipyard Commerce Center, and US Barge personnel, ship repair contractors, and tenants. The plan establishes the procedures for evacuating all personnel from the shipyard should an emergency warrant this action. It also establishes security procedures for contractor and tenant notification of the evacuation, and the direction of traffic flow out of the yard (See Figure 2.6.1). If an evacuation is ordered, the ship contractors and tenants are required to implement their respective evacuation plans, which should be coordinated with this plan.

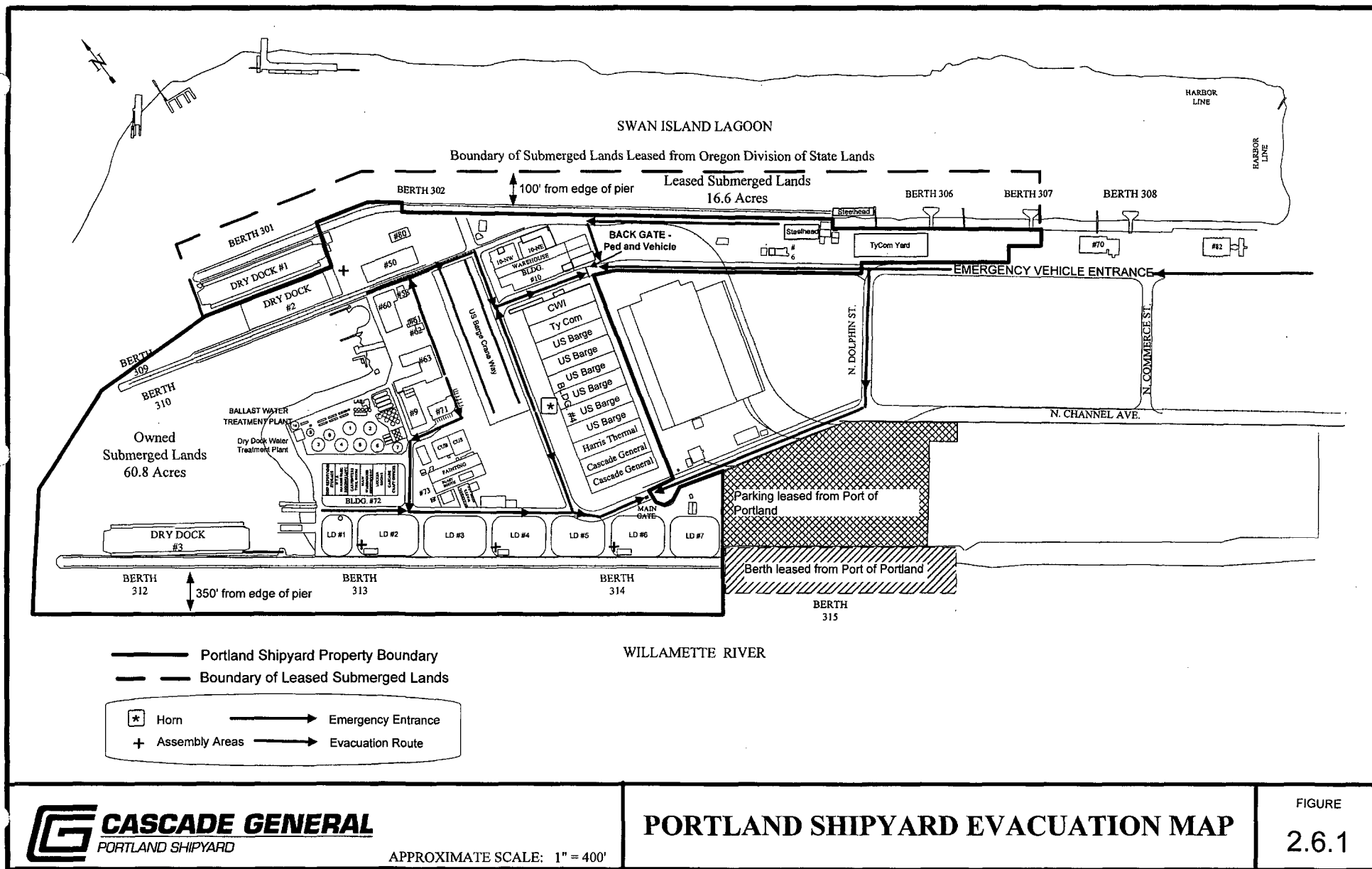
Evacuation procedures are initiated upon direction from an emergency response agency such as the U.S. Coast Guard, Office of Emergency Management, Oregon Department of Environmental Quality, public safety departments, or Shipyard Commerce Center Vice President and General Manager, or delegate thereof. Evacuation of the shipyard is deemed necessary when the health and safety of personnel is threatened by a potential or actual fire, explosion, hazardous material spill, or natural catastrophe or disaster. Security sounds the evacuation alarm to commence the evacuation procedures.

### ***2.6.1 Facility Evacuation Plan***

The Incident Commander on duty is responsible for ensuring that all procedures specified in this plan have been implemented. The Incident Commander assesses the situation and designates an assembly area and the appropriate evacuation route. Communication between the Incident Commander and Security is essential for disseminating information and coordinating the evacuation. The IC will contact the Director of Safety and Quality who will notify contractors and tenants listed in the following table.

## EMERGENCY CONTACT TENANT LIST

COMPANY	BUILDING	PHONE NO	ALT PHONE NO	ALT PHONE NO
Amerex	80	971-235-5386	503-283-8200	
American Bureau of Shipping (ABS)	72	503-805-3709	503-285-1434	
Columbia Wire and Iron (CWI)	4 (Bay 1, Annex)	503-319-6134	503-286-6600	
EnviroSolve Inc	10	1-877-9278 x11	918-587-9664	
Harris Thermal Transfer	4 (Bay 9)	503-286-3789	503-332-7181	
Industrial Marine	10	503-247-1701	904-233-7195	251-648-7787
Medical Services	72	503-247-1551		
Oregon Iron Works	Tom Bishor	503-956-1505		
Pacific International Marine (PIMMS)	72	503-228-0296	503-247-1481	
Performance Contracting (PCI)	10	503-285-4132	503-793-4296	
Purcell Painting & Coatings	Ben Bear	360-310-6143		
Seaport Transport	10	503.285-2553		
Specialty Finishes	10	503-247-1727	503-247-1944	1530 (Nights)
Steelhead Marine Construction	6, B306	503-515-8620		
Team Oregon	BH 314	541-737-3843		
Tyco - Global Sentinel		503-283-0052		
Tyco Telecommunications	4 (Bay 2)	503-283-8994	503-329-8977	
US Barge	Dave Byers	503-705-9849	503-432-5419	
Willamette Controls	50	503-319-7828		
Willamette Jet Boat	50 (Bay 4)	503-260-7299		



The Emergency Response Chain of command illustrated in flow chart 2.1.2 is followed for evacuations.

Security is responsible for the following actions:

- Notify 911;
- Notify Facility Director;
- Sound Evacuation alarm;
- Restrict access to the facility with the exception of emergency response personnel or equipment;
- Ensure Lagoon Avenue gate is open for emergency vehicle access;
- Direct traffic leaving the facility.

#### *2.6.1.1 Alarm Procedure*

In the event evacuation is necessary, the Main Gate officer sounds an alarm located on the west side of Building #4. The alarm signal is one blast lasting approximately ten seconds. Employees, tenants and contractors should dial the Shipyard Status Line, (503) 247-1400, to receive instructions about returning to the facility.

#### *2.6.1.2 Shut-Down Procedure*

Upon direction of the emergency response agency, or the Shipyard Commerce Center Vice President and General Manager or delegate, all operations at Cascade General will cease during an evacuation. If necessary, all nonessential utilities including gas, electricity, oxygen, and water, will be shut down either by the utility company or Support Services Department (SSD) personnel. SSD Supervisors will assist emergency response personnel with shut downs.

#### *2.6.1.3 Personnel Evacuation*

Two routes, Lagoon Avenue or Channel Avenue, may be used for evacuation by vehicular traffic. The evacuation route depends on the location of the hazard, prevailing wind direction and speed, and spill flow direction, if applicable. If these routes are unsafe for personnel, evacuation by water may be necessary. Water evacuation should be facilitated by the US Coast Guard with assistance from the emergency response agency or Multnomah County Police River Patrol.

The Incident Commander will specify the assembly area for personnel on a case-by-case basis. This area should be easily accessible for congregation and exiting the facility. Supervisors are responsible for conducting head counts and reporting to the Incident Command the status of personnel in their control.

#### *2.6.2 Community Evacuation*

Community Evacuation plans have been developed for areas of Multnomah County and the City of Portland where "life hazard situations" may occur. Evacuation of Cascade



General and Swan Island would be facilitated by the City and Multnomah County authorities.

The Portland Police Bureau has the authority to remove stalled and parked vehicles impeding the flow of traffic. Traffic flow direction may be altered or reversed at the discretion of the on-scene Incident Commander as designated by the Portland Office of Emergency Management. TRI-MET may designate buses to transport evacuated personnel from the area of concern.

### 3.0 HAZARD EVALUATION

#### 3.1 Hazard Identification

The hazard identification includes:

- a description of the facility
- information on storage tanks and surface impoundment
- associated potential hazards.

The following table summarizes the storage tanks containing oil-water mixtures and recovered oil.

#### UNDERGROUND AND ABOVEGROUND STORAGE TANK SUMMARY

Tank I.D.	Type AST or UST	Age	Material Stored	Capacity (barrels)	Failure?
T-2	AST	25	Reclaimed oil	24,000	none
T-3	AST	25	Oily water / oil	24,000	none
T-4	AST	25	Oily water / oil	24,000	none
T-5	AST	25	Oily water / oil	24,000	none
T-6	AST	25	Oily water / oil	24,000	none
T-10	AST	1	Oil	2,150	none
T-12	AST	25	reclaimed oil	2,000	none
T-13	AST	25	reclaimed oil	2,000	none
T-14	AST	25	reclaimed oil	2,000	none
T-15	AST	25	reclaimed oil	2,000	none
CUB-1	UST	25	heating oil	476	none
CUB-2	UST	25	heating oil	476	none
CLFS-1/AJHAK	UST	13	fuel	143	none
CLFS-2/AJHKJ	UST	13	fuel	143	none

A surface impoundment is defined in 40 CFR Part 112 Appendix F, 1.4.1, as "a facility or part of a facility which is a natural topographic depression, man-made excavation or diked area formed primarily of earthen materials... which is designed to hold an accumulation of liquid wastes or wastes containing free liquids..." The BWTP employs a four-foot berm constructed of a combination of concrete and soil covered by asphalt around the perimeter of the facility for impoundment. The volumetric capacity of the bermed area is designed to contain the volume of the largest tank, which is 24,000 barrels. Additionally, the berm includes approximately one foot of freeboard, or excess height, to compensate for potential

wave action which may result from a major oil spill. Table 3.1 shows the dike containment volume calculation.

Information on the day to day operations is provided in Section 7.2. Figure 2.2.1-D1 shows the layout of the Ballast Water Treatment Plant.

The average daily throughput of ballast water through the BWTP is approximately 650 barrels.

### ***3.2 Vulnerability Analysis – 40 CFR Part 112 Appendix G Section 1.4.2***

The vulnerability analysis is performed to identify receptors of potential spills such as WCD or small discharges. The receptors may receive exposure due to oil transport over land or along navigable water. The exposure area (EA) depends on many factors, including the oil volume and type, the local topography and drainage, proximity to navigable waters, and water velocity. When the EA is identified (using distance calculation methods), vulnerable sites and receptors within the EA are more easily identified. These may include: schools, medical facilities, residential areas, businesses, wetlands or other sensitive areas, fish and wildlife, lakes and streams, water intakes, recreational areas, transportation routes through different media (air, land, water), utilities, and other areas of economic importance.

Attachment C-111 to Appendix C of CFR Title 40 Part 112 provides several methods that can be used for estimating distances to environmentally sensitive areas. Distance calculations must be completed to identify the potentially impacted areas.

#### ***3.2.1 Description of Downstream Distance that Could Be Affected***

For planning purposes, formulas have been developed to determine distances from the point of discharge at the facility to the potential site of impact on both moving and still waters. Planning distances for the Portland Shipyard were calculated using the formula for moving waters. The planning distance formula for transport on moving waterways contains three variables: the velocity of the navigable water ( $v$ ), the response time interval ( $t$ ), and a conversion factor ( $c$ ).

The velocity,  $v$ , is determined by using the Chezy-Manning equation, which models the flow of water in open channels. The Chezy-Manning equation contains three variables:

- Manning's Roughness Coefficient,  $n$ , is based on stream morphology.
- The hydraulic radius,  $r$ , is generated using the average mid-channel depth from authorized charts.
- The average slope, of the river,  $s$ , is determined by using U.S. Geological Survey topographical maps.

Response time intervals,  $t$ , are selected to reflect time for arrival of response resources at the scene of a discharge based upon the type of water body and its location.

The following formula is used to calculate the planning distance on moving navigable waters:

$d = vxtxc$ ; where

$d$  = the distance downstream from a facility within which an environmentally sensitive area could be injured, or drinking water intake would be shut down in the event of an oil discharge (in miles);

$v$  = the velocity of the river/navigable water of concern (in ft/sec) as determined by Chezy Manning's equation;

$t$  = the time interval specified in hours and

$c$  = constant conversion factor of 0.68 sec-mile k-ft.

Chezy-Manning's equation is used to determine velocity:

$v = (1.5/n)rs$ ; where

$v$  = the velocity of the river (in ft/sec);

$n$  = Manning's Roughness Coefficient;

$r$  = the hydraulic radius, which can be approximated for parabolic channels by multiplying average mid-channel depth of the river (in feet) by 0.667; and

$s$  = the average slope of the river (unitless).

Applying the above formula to the PSY generates as follows:

(1) Solve for  $v$  by evaluating  $n$ ,  $r$ , and  $s$  for the Chezy-Manning equation -

$v = (1.5/n)rs$ ; where

$n = 0.035$  (major stream [top width > 100 ft], regular section

$r = 24.346$  ft (mid-channel depth of 36.5 ft x 0.667)

$s = 1.8 \times 10^{-4}$  (distance and change in elevation from the PSY to the nearest environmentally sensitive area, Kelley Point Park; therefore,

respectively - 7 ft/7.5 miles x 1 in-ft/5280 ft =  $1.8 \times 10^{-4}$ ;

therefore,

$$v = (1.5/0.035) \times (24.346) \times (1.8 \times 10^{-4}) = 4.83 \text{ feet/second}$$

(2)  $t$  value for the PSY: the resource response time is 27 hours.

(3) Solve for planning distance,  $d$  -

$$d = v \times t \times c$$

$$= (4.83 \text{ ft/sec}) \times (27 \text{ hours}) \times (0.68 \text{ sec-mile/hr-ft})$$

$$= 89 \text{ miles}$$

The Portland Ship Yard is located at river mile (RM) 8.3 of the Willamette River. Therefore the distance planning must include 80.7 RM of the Columbia River. The confluence of the two rivers occurs at RM 101.5 of the Columbia River.

Human populations, sensitive environments, and water intakes include the areas between RM 0 and 8.3 of the Willamette River, and RM 20.8 and 101.5 of the Columbia River.

### *3.2.2 Description of Human Populations within Planning Distance*

Vulnerability analyses address potential threats to human health, property, or the environment via groundwater, surface water, air, and land transmission of contaminants. The vulnerability analysis specifically addresses threats from surface water contact following an oil spill.

Table 3.2.1 presents the public and private resources vulnerable receptors that lie within the planning distance. The listed sites would be impacted either by direct contact with contaminated surface water or by their utilization of the water for drinking, cooling, or irrigation.

As noted in section 3.2, the Portland Ship Yard is located upstream from a number of public and private receptors. It is in the interests of protecting both public and private resources that the receptors in Table 3.2.1 have been chosen.



**Table 3.2.1  
VULNERABLE PUBLIC RECEPTORS**

SITE	TYPE	River Mile
Kelly Point Park	PUBLIC BEACH	
Unnamed marina	MARINA/MOORAGE	
Houseboats and private moorages	MARINA/MOORAGE	
Ridgefield Refuge (USFWS)	WATER INTAKE	
Bachelor Island Ranch	WATER INTAKE (5)	
Kalama Marina	MARINA/MOORAGE	
Kalama Chemical	WATER INTAKE	
Trojan Nuclear Power Plant	WATER INTAKE	
City of Rainier residential drinking water	WATER INTAKE	
Longview Fibre	WATER INTAKE	
Weyerhaeuser Company	WATER INTAKE (4)	
Houseboats and private moorages	MARINA/MOORAGE	
Neil Scott	WATER INTAKE	
Howard Rice	WATER INTAKE	
Douglas Rice	WATER INTAKE	
Van Youngquist irrigation water	WATER INTAKE	
Willow Grove Beach Park	PUBLIC BEACH	
River Park	PUBLIC BEACH	
Portland General Electric	WATER INTAKE	
Houseboats and private moorages	MARINA/MOORAGE	
Wauna Mill	PORT/INDUSTRIAL MOORAGE	
Wauna Mill	WATER INTAKE	
Elochman Slough log sort yard	MARINA/MOORAGE	
Elochman Slough log sort yard	PORT/INDUSTRIAL MOORAGE	
Columbia White-Tailed Deer National Wildlife Refuge (USFWS)	WATER INTAKE	
Port of Wahkiakum	WATER INTAKE	
Skamokawa, Vista Park	PUBLIC BEACH	
Houseboats and private moorages	MARINA/MOORAGE	
Houseboats and private moorages	MARINA/MOORAGE	
Private moorages	MARINA/MOORAGE	
Private residential drinking water	WATER INTAKE	

### *3.2.3 Description of Sensitive Environments and Drinking Water Intakes*

Wildlife and humans use the waterways, contiguous shorelines, and inland areas throughout the planning distance. The following table presents sensitive environments and drinking water intakes information within the planning distance, but is not inclusive.

Many of the sensitive environments are islands and entrances to waterways (sloughs, rivers, channels, etc.). Pre-staged booms available for protecting these sites are housed throughout the planning distance (Section 6.3 CRC Equipment List, Section 5.0). Booms are deployed by Clean River Cooperative personnel or their subcontractors in accordance with the Lower Columbia River Geographic Response Plan following notification of a release. The phone numbers for persons responsible for each of these sensitive environments are listed in Table 3-2-2.

**Table 3.2.2**  
**Sensitive Environments and Drinking Water Intakes**

<i>Location</i>	<i>River Mile</i>	<i>Telephone</i>
Terminal 4 Sheriffs Dock	4.5*	* (503) 286-8418
Multnomah Channel	3.0*	(503) 220-2040
Columbia Slough	0.9*	(503) 220-2040
Vancouver Lake Channel	101	(503) 220-2040
Ridgefield Refuge (USFWS) water intake	93.5	(360) 887-4106
Hathaway Lake Entrance	92.3	(503) 220-2040
Bachelor Island Slough	91.5 & 87.6	(503) 220-2040
Bachelor Island Ranch water intakes	90.6 & 89.4	N/A
West Side of Lewis River	84.0-87.0	(503) 220-2040
Deer Island Slough	82.4	(503) 220-2040
Burke Island/Martin Island	81.0-81.3	(503) 220-2040
Kalama Chemical water intake	74.5	(360) 673-2550
Kalama River	73.0	(503) 220-2040
Cottonwood Island	72.0-70.0	(503) 220-2040
Caroll's Channel	71.5	(503) 220-2040
Longview Dock	67.5	(360) 577-3130 8-5, M-F/(360) 574-4239 (360) 578-9566
City of Rainier drinking water intake	67.5	(1503) 556-9144
Longview Fibre water intake	67.5	(360) 425-1550 8-5, M-F/(360) 425-1551 5-8 M- F+ weekdays & holidays
Slaughters Dike Entrance	66.0	(503) 220-2040
Weyerhaeuser Company water intake	64.0	(360) 425-2150
Fisher Island	60.4-60.0	(503) 220-2040
Van Youngquist irrigation water intake	59.5	(360) 577-0504
Howard Rice water intake	59	(360) 577-8468
Douglas Rice water intake	59	N/A
Neil Scott water intake	58.5	(360) 423-1634
Coal Creek	57.0	(503) 220-2040
Crims Island	57.0	(503) 220-2040
PGE Beaver Generating Plant water intake	53.5	(503) 464-8343
Wallace Island	50.0	(503) 220-2040
Cathlamet Channel	47.0	(503) 220-2040
Puget Island	46.0	(503) 220-2040
Westport Slough	43.3	(503) 220-2040
Wauna Channel	42.0	(503) 220-2040
Wauna NO water intake	41.6	(503) 455-3239
Elochman Slough	37.0	(503) 220-2040
Columbia White-Tailed Deer National Wildlife Refuge (FJSFWS)	35.8	(360) 795-3915
Steamboat Slough		(503) 220-2040
Port of Wahkiakum	34.5	(360) 795-3754 Port (360) 795-3234 Sheriff
Brooks Slough	33.0	(503) 220-2040
Skamokawa Marine	33.0	N/A
Big Creek entrance	28.0	(503) 220-2040
Karlson. Island	27.0	(503) 220-2040
Miller Sands Lagoon	24.0	(503) 220-2040
Crooked Creek	23.0	(503) 220-2040
Grays River	22.5	(503) 220-2040
Private residential drinking water intake	22.2	N/A
Deep River	21.0 1	(503) 220-2040

\* = Willamette River miles; all others Columbia River miles

### ***3.3 Risk Analysis – 40 CFR Part 112 Appendix F Section 1.4.3***

Cascade General, Inc. submits the engineering study conducted by CenturyWest Engineering on behalf of the Port of Portland as the Risk Analysis. Because operational capabilities and procedures of the facility remain relatively unchanged from those instituted by the Port of Portland, Cascade General, Inc. believes the work done by CenturyWest is viable today. It is our opinion that the Facility Prevention Plan and Risk Analysis offers good information about risks inherent and prevention methodologies prevalent at the shipyard. The document is included in its entirety as Appendix 6.7.

Hazards posed by natural hazards should be considered in a job hazard analysis before work commences. In the event of a natural disaster, Cascade General is prepared to undertake an orderly shutdown of operations and evacuation of its employees as described in the Emergency Response Plan, available for inspection by the appropriate agencies.

The Incident Command System would be implemented in response to a natural disaster effecting the operation and safety of the facility.

### ***3.4 Facility Spill History – 40 CFR Part 112 Appendix F Section 1.4.4***

#### **April 13, 2007**

150-200 gallons of lube oil spilled from the M/V MISSISSIPPI VOYAGER into the Swan Island Lagoon due to a failed coupling on a transfer hose while pumping oil from the vessel to a slop tank. All oil was contained in pre-deployed boom around vessel. Clean Rivers Coop, West Coast Marine Cleaning and Cowlitz Clean Sweep responded and placed secondary boom at highest concentrations of oil. A vacuum truck was utilized to recover approximately 2,000 gallons of oil/water. All pilings were high-pressure washed, air curtains were used to keep oil in concentration while several applications of sorbent boom and pads were applied, and removed and placed in a lined yard box for proper disposal to Hillsboro Landfill.

#### **April 7, 2007**

While conducting a residual waste oil transfer to a slop tank on board the M/V POLAR ENDEAVOR, a pinhole leak appeared in a 1.5" transfer line resulting in an approximately ½ cup spill producing a 3' x 5' sheen on the Willamette River but no sheen was in evidence 8 minutes after the spill report. Oil was contained in pre-deployed boom, transfer immediately secured and hose was replaced. Hoses will be inspected for excessive wear more thoroughly in the future.

#### **December 4, 2006**

Approximately ½ gallon of oil entered the CGI boat basin from a slow drip in an above-ground fixed piping line to due a worn gasket in the line connection. All sheen was contained in CGI pre-deployed boom, was not feasible for cleanup and was allowed to dissipate. WCMC deployed sorbent boom and pads at the drip site until the piping could be removed and the gasket replaced. USCG issued a penalty in the amount of \$1,000.00.

November 17, 2006

Approximately 5 gallons of hydraulic oil entered a storm drain during a severe rain storm and flowed into the Swan Island Lagoon from a broken forklift hydraulic line creating a large sheen. Total forklift capacity: 40 gallons. WCMC placed boom to concentrate sheen and proceeded to clean with sorbent pads. All drains in vicinity of spill protected with sorbent boom. Roadways cleaned with sorbent pads and "kitty litter." USCG issued a penalty in the amount of \$500.00.

September 23, 2006

During docking operations on DD#1, a check valve on the wastewater collection system failed and oil within the piping for the collection back-flowed resulting in a release of approximately 5 gallons of oil into the Willamette River. Dock master noticed sheen and immediately called West Coast Marine Cleaning to boom. Boom was in place 20 minutes later. Dock crew closed manual valve. Environmental Director also had air curtain to corral discharge. Oily water was confined to dry dock. Dock master started pumps and pumped approximately 4,000 gals back into T-16 to recover oily water. USCG issued a penalty in the amount of \$250.00.

September 13, 2006

CGI work boat "burped" approximately ½ gallon of oil from aft tank vent due to a faulty equalizing line leaving one tank almost empty and the other full. Heat probably caused the fuel to expand in the full tank which then leaked from the vent into the PSY boat basin causing a 15' x 20' sheen. Machinists took boat out of service and fixed fuel lines. USCG investigated...no penalty issued.

May 13, 2004

Less than 5 gallons of oil spilled onto the wooden floor of Dry Dock #1 was not completely removed during the cleanup of the dry dock floor prior to undocking. When the dry dock was flooded to undock the vessel, oil was released from the wooden deck creating a sheen. Pre-deployed boom and air curtains were used to contain and consolidate the sheen within the dry dock basin. The sheen was unrecoverable using absorbent materials. Sunshine dissipated the sheen by 5/14/04. USCG notified and responded; report given to OR DEQ. No further enforcement action

March 21, 2000

12-20 gallons of diesel oil spilled into the Willamette River from the ESPARANZA power barge due to a flaw in a newly constructed fuel tank system. Fuel was contained inside pre-staged boom. USCG issued a \$5,000.00 penalty for spilled oil.

October 23, 1999

While flushing a tank onboard the USS RODNEY M HARRIS, a hose ruptured, spilling approx. 10 gallons of lube oil into the Willamette River. The USCG issued a \$500.00 penalty.

January 29, 1999

While removing a propeller from a vessel in dry dock, wind blew oil dripping from the propeller into a drain inside the dry dock which let into the Willamette River.



Approximately 5 gallons of oil went into the water. The USCG issued a penalty of \$500.00.

October 28, 1998

While using a generator on the pier, a worker accidentally filled the wrong tank, spilling approx. 25 gallons of gasoline on the pier, of which approximately 5 gallons reached the Willamette River. The USCG issued a penalty in the amount of \$500.00.

November 13, 1997

A bleeder valve failed during a hydrostatic test and approximately 30-50 gallons of waste oil was discharged into the water. Oil spill contractor Scott Gilfillan responded with ten personnel, 2 skiffs, sorbent boom, pads, and oil snare. Cleanup costs totaled \$10,046.98. The USCG issued a penalty in the amount of \$1,250.00.

September 23, 1996

After completion of oil transfer operations, personnel failed to install the cap on a hose resulting in approximately 5 gallons of crude oil spilling into the Willamette River. Appropriate cleanup performed according to the USCG. USCG issued a penalty in the amount of \$1,250.00.

#### 4.0 SPILL SCENARIOS 40 CFR PART 112 APPENDIX F SECTION 1.5.1

Spill scenarios are developed to represent small, medium, and worst case spills. A multi-level approach is used to illustrate response actions, which would be undertaken in spills of different magnitudes under differing circumstances.

The worst case discharge is based on the volume of the largest above ground storage tank (AST) in an adequate secondary containment from a single manifold. Although the piping system for oil storage Tanks T-2 – T-6 leads to a common manifold, there are isolation valves in place on each tank preventing any multiple tank discharge. Tank T-1 does not store oil; Tanks T-3 through T-6 are used to store ballast water and waste oils with an oil-water mixture consisting of approximately twenty-five percent oil. Tank T-2, however, stores a more concentrated recovered waste oil solution and is approximately 75% oil. The maximum volume of oil for this tank is, then, approximately 18,000 bbl. However, the actual capacity of this storage tank, 24,000 barrels, will be used for WCD spill response planning purposes, as per Title 40 CFR Part 112, Appendix D Part A2.1-2.3.

##### Appendix D Calculations - Secondary Containment - Multiple Tank Facilities

A2. Are all ASTs at the facility without adequate secondary containment? No

A.2.1 Not Applicable

A.2.2. Total AST capacity without adequate secondary containment 0

A.2.3 Worst Case Discharge: Capacity of largest single AST + A.2.2 24,000 bbl

Based on the worksheet calculation and EPA guidelines, the planning volume for the medium discharge scenario was determined to 36,000 gallons (857 barrels). The USCG planning level of maximum most probable discharge calls for the lesser of either 1200 barrels or ten percent of the worst case discharge (2400 barrels). The planning level as per 40 CFR 112 App. E, 4.2.1 is for the greater of these two amounts, or 1200 barrels. The volumes used for discharge scenarios are summarized in the following table:

USCG Discharge	EPA Discharge	Volume
Scenarios	Scenarios	(barrels)
Average Most Probable	Small	50
Maximum Most Probable	Medium	1200
Worst Case	Worst Case	24,000

##### 4.1 Small Discharge Scenario (EPA), Average Most Probable Discharge Scenario (USCG)

###### Incident:

At 1400 hours the person manning the pier side header station witnesses a third party barge involved in the dock transfer operation overfilling one of the barge compartments. The header watchman immediately closes the dock riser valve. He then notifies the pumping control operator (person in charge) at the terminal to shut down the product pump involved in the transfer, tells the barge man of the spill, and notifies Security that approximately 50 bbl of #2 diesel was spilled into the Willamette River by the barge man.

Conditions:

Weather      Light rain, temperature 57 degrees, winds from the north at 10 knots  
Water        Maximum daily current of 2.8 knots with favorable wave conditions from  
              skimming.  
Forecast     Cloudy, high temperature of 59 degrees, continued winds from the north at  
              10-15 knots with persistent light rain throughout the day.

Immediate Response:

The header watchman shuts off the flow of product to the barge by closing the dock riser valve and notifying the pumping control operator to cease the pumping. He radios Security giving time, circumstances, and instructions to notify the Spill Response Coordinator. The barge man levels out the product in the barge compartments and begins cleanup of the barge deck by use of absorbents. Security, upon direction from the Spill Response Coordinator, notifies the Fire Bureau, OERS, NRC, Clean Rivers, WCMC, spill response team, Barge company representatives, and Portland USCG MSO.

As noted in the safety and health guidelines, the person in charge checks the MSDS information for #2 diesel and with consultation from the Spill Response Coordinator. It is determined that the spilled diesel fuel presents a low health risk for cleanup workers or the community based upon the characteristically low levels of benzene. With the product flow shut down, the header watchman is outfitted with appropriate personal protective equipment (PPE) and proceeds to the boathouse and deploys 1000 feet of boom to contain the spilled fuel.

Vessel response is provided by the bargeman by deploying absorbents and closing all deck scuppers. The used absorbents are placed in plastic garbage bags and passed to the dock to put in one lined ten-yard box for proper disposal.

Containment and Cleanup:

Recovery operations begin after the spilled oil is completely contained by the boom. Cleanup resources and personnel include the On-scene Commander, Clean Rivers Cooperative Manager, Barge company representative, USCG Representative, Cowlitz Clean Sweep Response Manager, and DEQ representative. The barge company's cleanup resources are deployed on-scene at 1500. A small boat with sorbent boom is deployed to recover the oil before it reaches the shoreline.

Small skimmers and sorbent are placed along the shoreline in preparation for oil recovery. Vacuum trucks are ordered and arrival on scene is anticipated within 30 minutes to begin recovery operations. Clean River resources are utilized for additional boom, sorbent, drums, and labor. The barge company uses an available tug to assist recovery operation by utilizing prop wash, and water cannon in herding the oil. Additional sorbent booms are deployed and used sorbent removed and placed in drums. Water wash, skimming operations, and tightening of containment boom continue until the oil is contained and recovered. Spent sorbent is disposed of by an approved waste disposal company, and the recovered oil is transferred to the Ballast Water Treatment Plant for oil/water separation.

#### Post Spill Review and Reporting:

The On-Scene Commander convenes a meeting the next day to review the circumstances of the spill and discuss preventative measures. A report is prepared for submittal to DEQ.

#### ***4.2 Medium Discharge Scenario (EPA), Maximum Most Probable Discharge Scenario (USCG)***

##### Incident:

At approximately 1000 on a Saturday morning, approximately 1200 barrels of oily water spills into the River from the pier slop line due to a pipeline rupture. The quantity represents the ruptured line pumping for thirty minutes prior to detection.

##### Conditions:

Weather: Light rain, temperature 75 degrees, winds from the north at 15 knots.

Water: Maximum daily current of 2.0 knots with favorable wave conditions for skimming.

Forecast: Cloudy, high temperature of 85 degrees, continued winds from the north at 15 knots with intermittent light rain.

##### Immediate Response:

The security guard smells a strong odor and investigates the origin. Upon arriving at the dock, he sees the ruptured line and reports the incident to the Spill Response Coordinator who calls the Person-In-Charge (PIC) at the BWTP. The PIC immediately shuts down the transfer, securing operations. The Spill Response Coordinator has security notify National Response Center, OERS, Clean Rivers Coop, West Coast Marine Cleaning, Cascade General Spill Response Team, a general repair contractor, USCG MSO Portland, and the Fire Bureau.

Based on the percentage of oil in the water, the spilled product is determined to present a low human health risk. Proper PPE is donned and the containment and cleanup procedures are initiated.

##### Containment and Cleanup:

The vessel is completely boomed off as per facility best management practices and all the spilled oil is contained in that boom and the pre-deployed facility boom along the pier. In addition, approximately 4,400 feet of deployable boom is staged at the PSY. A small boat is used to deploy this boom as secondary containment around the perimeter of the pre-staged boom to further prevent the oil from escaping. By 1100 hours, Clean Rivers Cooperative, West Coast Marine, Cowlitz Clean Sweep respond with additional boom, up to 5,600 feet, and sorbent material, skimming equipment and a vacuum truck to recover the spilled product.

Recovery operations begin after the secondary containment boom is in place. A command post is formed in the Cafeteria area of Bldg. 72 and is staffed by the USCG and state OCS's, Spill Response Coordinator, Coop Manager, and Barge company representative. Spill response contractors and facility spill response team members also fill key ICS positions. The barge company's cleanup resources are deployed on-scene at 1500. Small skimmers and sorbent are placed inside the boom in preparation for oil recovery. Vacuum trucks have been ordered and will arrive on scene within 30 minutes to begin recovery operations.

Additional sorbent booms are deployed to catch any oil sheen and keep it from migrating down river. Water wash, skimming operations, and tightening of containment boom continue until the oil is contained and recovered.

Spent sorbent is disposed of at an approved waste disposal facility, and the recovered oil is transferred to the Ballast Water Treatment Plant for oil/water separation and storage.

#### Post Spill Review and Reporting:

The Spill Response Coordinator convenes a meeting the next day to review the circumstances of the spill and discuss preventive measures. A report prepared for submittal to DEQ.

### ***4.3 Worst Case Discharge EPA and USCG***

#### Incident Part 1

At 0800 on Sunday, a massive earthquake occurs and causes Tank 2 in the BWTP to rupture, spilling 24,000 barrels of oil.

#### Conditions

Weather: Clear day, temperature 75 degrees, winds from the north at 5 knots

Water: Maximum daily current of 2.0 knots with favorable skimming conditions.

Forecast: Clear with a high of 80 degrees and continued intermittent winds from the north at 5-10 knots.

#### Immediate Response

Immediate response is focused on personnel safety. Vice President and General Manager of the Ship Yard Commerce center notifies main gate security that yard is shut down and all non-essential personnel are to be evacuated. Security notifies 911 and sounds alarm. Evacuation proceeds. Facilities personnel shut down all non-essential utilities. Security is notified that Tank 2 has ruptured and is spilling its contents of approximately 24,000 barrels of oily water into containment. Security notifies the Fire Bureau, Oregon Emergency Response System, National Response Center, Clean Rivers Coop, Cascade General Spill Response Team, and USCG Portland MSO prior to departure. No further cleanup/response actions taken that day.

#### Containment and Cleanup

Spill cleanup proceeds the following day when conditions have somewhat stabilized. At 1000, an ICS command post is set up in the Cafeteria area of Bldg. 72 and staffed by



USCG Federal On Scene Coordinator, DEQ State On Scene Coordinator, Clean Rivers Cooperative Spill Response Coordinator, Facility Incident Commander, Cowlitz Clean Sweep and Cascade General Response Team representatives. No oil has left the containment at this time. Total estimate of oil to recover at this time is just over 11,000 barrels based on the concentration of oil in Tank 2 at 75% and weathering of that oily water for 26 hours. Initial cleanup actions are focused on restoring utilities or obtaining generators to enable the BWTP to pump oil into next available tank.

#### Incident Part 2

Suddenly, a strong aftershock occurs. At 1105, the BWTP notifies ICS that secondary containment has failed and oil is spilling into the water.

#### Immediate Response

BWTP personnel are proceeding to shore the containment rupture. Containment and recovery focus now combines oil recovery in the tank farm with on-water recovery and sensitive area protection.

#### Containment and Cleanup

As a preventive measure, 10,000 feet of oil containment boom permanently surrounds the entire Portland ShipYard. Within the next hour, 1,000 feet of boom pre-staged along Pier C is redeployed to contain the entire boat basin, running from the head of Pier C to the head of dry dock #3. At 1155, the BWTP reports that the rupture is shored and no further oily water from Tank 2 is spilling into the water. Total estimate of oil released into the water is approximately 300 barrels. In addition to the pre-staged permanent boom, approximately 4,400 feet of boom is available for deployment from the facility. This boom is deployed by facility personnel and WCMC as secondary containment boom around the boat basin.

Clean Rivers Cooperative will provide skimmers and coordinate with facility personnel to provide available storage tanks. Cowlitz Clean Sweep will respond with additional boom and skimming equipment within two hours to protect environmentally sensitive areas as per the Lower Columbia River Geographic Response Plan. This protective booming is only precautionary as a result of this spill, however, as the distance downstream impacted by the oil spill would be minimized by the effective containment of the oil.

Power is restored and, after 12 hours, the BWTP has transferred approximately 70% of oily water into another tank. CCS and facility personnel focus on shoreline cleanup while WCMC and CRC finish on-water recovery with sorbent boom and pads.

#### Personnel and Equipment

On water recovery operations begin after the spilled oil is completely contained by the boom. Cleanup resources and personnel include the following individuals:

- Spill Response Coordinator
- Facility Incident Commander
- Cascade General Response Team (Qualified Personnel listed in Table 5.2)
- Clean Rivers Cooperative Manager
- Cowlitz Clean Sweep Response Manager (Available personnel listed in Section 6.4.3 )
- USCG FOSC
- ORDEQ SOSC

Additional sorbent booms are deployed. Used sorbent are removed and secured in drums. Water wash, skimming operations, and tightening of containment booms continue until the oil is contained and recovered. Facility response equipment is listed in Figure 2.2.3.A1.

The oil spill recovery equipment provided by Clean Rivers Cooperative has a total rated oil recovery capacity of approximately 8,329 barrels per twenty-four hours. Assuming a two hour response time, and a maximum three hour deployment, the spill would be remediated within twelve hours. CCS response equipment is listed in Section 6.3.

Spent sorbent pads and booms are disposed of at an approved waste disposal facility. Recovered oil from skimmers is transferred to the Ballast Water Treatment Plant for oil/water separation and storage.

#### Post Spill Review and Reporting

The Spill Response coordinator convenes a meeting the next day to review the circumstances of the spill and discuss preventive measures. A report is prepared for submittal to DEQ.

## 5.0 TRAINING, DRILLS, AND INSPECTIONS

The federal Occupational Safety and Health Administration (OSHA) established a rule on March 6, 1990 requiring minimum training and/or competency requirements for personnel involved with hazardous waste site and facility or transportation operations involving emergencies (significant spills of refined and crude petroleum products would be classified as emergencies). This rule, known as the Hazardous Waste Operations and Emergency Response (HAZWOPER) rule (29 CFR 1910.120 (q)) identifies five levels of response (Table 5.0) requiring specific training and expertise. Requirements for individuals comprising the Spill Response Team will vary according to their job description/function, specific areas of responsibilities and degree of potential exposure that may be experienced during an oil spill response.

Table 5.0 HAZWOPER Emergency Response Levels	
Level	Description
1	Witness or discover a discharge. Sole emergency response responsibility is to notify vessel Ship Superintendent
2	First responders to releases as part of initial response effort. Trained to respond in a defensive manner (booming to contain the release to keep it from spreading), but not to stop the release.
3	Hazardous materials technician trained to stop the release. These individuals plug, patch, or otherwise block the release of oil at its source.
4	Hazardous materials specialists trained to have a specific knowledge of hazardous releases and substances. Manage spill cleanup operations and act as liaisons with government authorities.
5	Incident Commander (or OSC) for lead agency or spill response coordinator for industry spill response team; assumes control of the incident.

### 5.1 Training procedures

Training requirements for members of the Spill Response Team are detailed in Table 5.1.

Emergency response support personnel (truck drivers, helicopter pilots, etc.) whose skills are only needed temporarily in support of emergency response operations are not required to meet the training requirements listed in Table 5.1, but should be aware of potential hazards associated with the duties that they are expected to perform prior to beginning operations at the site.

Refresher training is required annually in order to qualify at any response level. Each Spill Response Team member must receive (and be prepared to provide) documentation and certification that he/she has completed the training required for his/her position within the Spill Response Team. Each Spill Response Coordinator collects and maintains a file documenting the training received by spill response team personnel.

At a minimum, annual training should be conducted for all personnel involved in this Plan in order to review Plan procedures and any updates and amendments. Training frequency may be increased if spill response drills indicate improper or inadequate spill response capabilities among response personnel. An outline for a 24-hour oil spill response training program is presented in Figure 5.1-1. Table 5.1 shows the initial training requirements for Cascade General Emergency Response Team members. Training records for Cascade General personnel and personnel of the Oil Spill Removal Organization will be maintained and made available upon request. Training records will be kept for three years.

Volunteers or casual laborers used during a spill response are to receive training adequate for the exposure to the hazard and to comply with the guidelines of 29 CFR 1910.120. It is the intent that volunteers or casual laborers are intended for logistics support with no exposure to the hazard or for limited beach cleanup with minimal hazards. Any decision to use volunteers or casual laborers where limited exposures may occur will be made in consultation with Federal and State On-Scene Coordinators.

Table 5.1 Initial Training Requirements *	
Response Level	Training Required
1 <i>First Responders</i>	Sufficient to demonstrate competency at position
2 <i>AWZ members</i> <i>First Responder</i>	Minimum 8 hours or sufficient to demonstrate competency at response level 1.
3 <i>HAZ Mat Tech</i>	At least 24 hours of level 2 and proven experience in specific competencies.
4 <i>HAZ Mat Spec</i>	At least 24 hours of level 3 and proven experience in specific competencies.
5 <i>OSC</i>	At least 24 hours of level 2 and additional competencies.

\* See 29 CFR 1910.120 (q)(6)(i)

Table 5.2

## Emergency Response Personnel

Contact/Organization	Training Response Level	Work Phone	Home Phone	Alternate Number
<b>Primary Emergency Coordinator</b>				
Alan Sprott	5	(503) 247-1672	██████████	(503) 703-0875 (cell)
<b>Incident Commanders</b>				
Alan Sprott	5	(503) 247-1672	██████████	(503) 703-0875 (cell)
Lian Jewell	5	(503) 247-1806	██████████	(503) 781-8161 (cell)
<b>Spill Response Team Members</b>				
Tony Boehm	3	(503) 247-1670		(503) 880-8761 (cell)
Ken Bonnell	3	Radio Channel #13		
Jason Brindley	3	Radio Channel #13		
Michael L. Brungardt	3	Radio Channel #13		
Adam Bullock	3	Radio Channel #13		
Roy Bullock	3	(503) 247-1633		
Paul Cobb	3	(503) 247-1674		(503) 709-3841 (cell)
Bob Collinson	4	(503) 247-1634		(503) 539-4859 (cell)
Doug Eaton	3	Radio Channel #13		
Jerry Hunt	3	(503) 247-1639	██████████	(503) 705-4428 (cell)
Jose Moreno	3	(503) 247-1408		(503) 880-6037 (cell)
Eric Oman	4	(503) 247-1820		(503) 709-1719 (cell)
Mike Scull	3	(503) 247-1642		(503) 805-0995 (cell)
Jennifer Senner	3	(503) 247-1974		(503) 913-6444 (cell)
Bob Taylor	3	(503) 247-1857		(503) 805-4954 (cell)
Jim L. Snell	3	Radio Channel #13		
Darren Stevens	3	Radio Channel #13		
Don Windsor	3	Radio Channel #13		
<b>Facility Contacts</b>				
Ken Swingle	3	(503) 247-1667	██████████	(503) 702-2292 (cell)
Jerry Hunt	3	(503) 247-1639	██████████	(503) 705-4428 (cell)
<b>Main Gate/Security</b>		(503) 247-1799		
Lindsay Docherty	3	(503) 247-1761	██████████	(503) 804-8539 (cell)



FIGURE 5.1-1  
HAZARDOUS MATERIALS TECHNICIAN TRAINING OUTLINE  
29 CFR 1910.120(q)(6)(iii)

**INTRODUCTION**

**HAZARD COMMUNICATION**

- Labeling
- Chemical Inventory
- Material Safety Data Sheets (MSDS)
- Training
- Recognition of Hazardous Substances
- Basic Risk Assessment

**TOXICOLOGY**

- Basic Toxicological Properties and Terminology
- Emphasis on Products and Processes Specific to Petroleum Industry

**FLAMMABLE MATERIALS**

**CORROSIVE MATERIALS**

**FIELD SURVEY INSTRUMENTS**

- Combustible Gas Indicators
- Specific Gas Indicators (e.g. Hydrogen Sulfide Meters)

**RESPIRATORY PROTECTION**

- Air Purifying
- Air Supplying
- Selection Factors
- Equipment Limitations
- Fit Testing

**CHEMICAL PROTECTIVE CLOTHING**

- Recommended Personal Protective Equipment for Petroleum Spills

**CONTROL, CONTAINMENT, AND RECOVERY OPERATIONS**

- Oil Spill Prevention and Control Methods
- Open Water Booming Techniques
- Shore Side Boom Deployment
- Properties of Spilled Petroleum Products
- Criteria for Absorbent Selection
- Behavior of Oil Spilled to Water
- Physical Hazards
- Air Monitoring Requirements

**DECONTAMINATION PROCEDURES**

**EMPLOYER'S OIL SPILL CONTINGENCY PLAN**

- Detailed Overview of Plan
- Explanation of Incident Command System (ICS)
- Explanation of Federal, State, and Local Emergency Response Plans and Teams

**EMERGENCY TERMINATION PROCEDURES**

**CONFINED SPACE ENTRY PROCEDURES**

**MEDICAL MONITORING REQUIREMENTS**

## **5.2 Drill Procedures and Schedules**

Cascade General may notify the Department of Environmental Quality of a drill in order to have Department involvement with the participation, review, and evaluation of the spill response. Any of the above exercise requirements may be met through this process if the Department finds that the spill event adequately tests the plan.

Facility personnel participate in any COTP announced drill/exercise.

Personnel, training and drill records are maintained for 3 years by Environmental Services.

Drills that are held by other recognized authorities may meet requirements of OAR 340-141-0200.

### **Exercises and Drills**

Tri-Annual: Every three years the entire Plan is reviewed by means of a drill exercise.

Annual: Cascade General, Inc., should conduct:

- Tabletop exercises for spill management teams.
- One exercise among these training exercises should be unannounced, although it may be a test of the Emergency Response Plan procedures.
- One exercise in three years should involve a worst-case scenario.
- Response Resources, identified in the Plan, participate in annual drills.

The Department may require Cascade General, Inc., to participate in an announced limited deployment drill annually. It may require Cascade General, Inc. to participate in an unannounced full deployment drill annually.

Semi-annual: Cascade General conducts semi-annual drills to test the capabilities of the Spill Response Team and to exercise the elements of the Plan requirements. An actual response to a spill may be used in place of a drill. The Environmental Department coordinates training with the Spill Response Team members and boat operators. Training exercises include operating the response boats, setting anchors, deploying and restoring boom, and cleaning up surface water.

Quarterly: Cascade General conducts qualified individual notification exercises (internal callout procedures). These are only to involve notification, not actual deployment.

Monthly: Facility and qualified individual (QI) notification drills should be conducted monthly.

### 5.3 *Type of Spill Drills and Call-Outs*

From year to year scheduling of these drills should allow for practice under a variety of weather conditions. At a minimum, these drills should be structured so that observations and evaluations can be made with respect to:

- Adequacy of response action plans;
- Effectiveness of communications system;
- Capability of spill response equipment;
- Adequacy of response times;
- Organization of the Spill Response Team.

Spill drill response activities should include the following operational areas:

#### 1. Detection and Assessment

Spill detection and notification of the Spill Response Coordinator is simulated (~~per Section 4.5~~). While the USCG may be notified of the spill response exercise, an actual call to the NRC is not necessary, but useful to note the calling procedure. The Spill Response Coordinator assesses the spill and initiates the response plan.

#### 2. Response Actions

Personnel designated in the spill response organization (Figures 3.2-2 and 3.2-7) should perform their response action duties as described in Section 3.2.2. Equipment deployment and the availability of personnel and working condition of equipment should be evaluated.

#### 3. Communications

Communications equipment should be tested for operability, and response personnel evaluated for familiarity with this equipment.

#### 4. Documentation

A mock spill report should be generated showing response times, deployment times, availability of adequate personnel and equipment, effectiveness of communications, and overall evaluation of the spill response operations.

#### 5. Post-Spill Review

Criticisms and observations should be sought from all Spill Response Team participants, and discussions held with respect to any needs for Plan changes or updates.

#### 6. Internal Call-Outs

The response drill should include an internal call-out to the Spill Cleanup Manager or alternate.

#### 7. Discharge Prevention Meeting

Discharge Prevention Meetings should be conducted periodically to aid facility personnel in spill prevention awareness and response requirements. These meetings may be conducted in conjunction with the Safety Toolbox Topic meetings.

#### **5.4 Facility Self Inspections**

Facility self-inspections are conducted routinely. These include Tank Inspections, Response Equipment, and Secondary Containment Inspections.

##### *Tank Inspections*

Tank inspections should be conducted semi-annually and include checks for leaks. Deficiencies are noted and action taken to correct the deficiencies. Documentation maintained by the Support Services Department is available for review.

##### *Response Equipment*

Response equipment should be inspected every quarter. Action is taken to correct any deficiencies. Documentation is maintained by the Support Services Department is available for review.

##### *Secondary Containment Inspections*

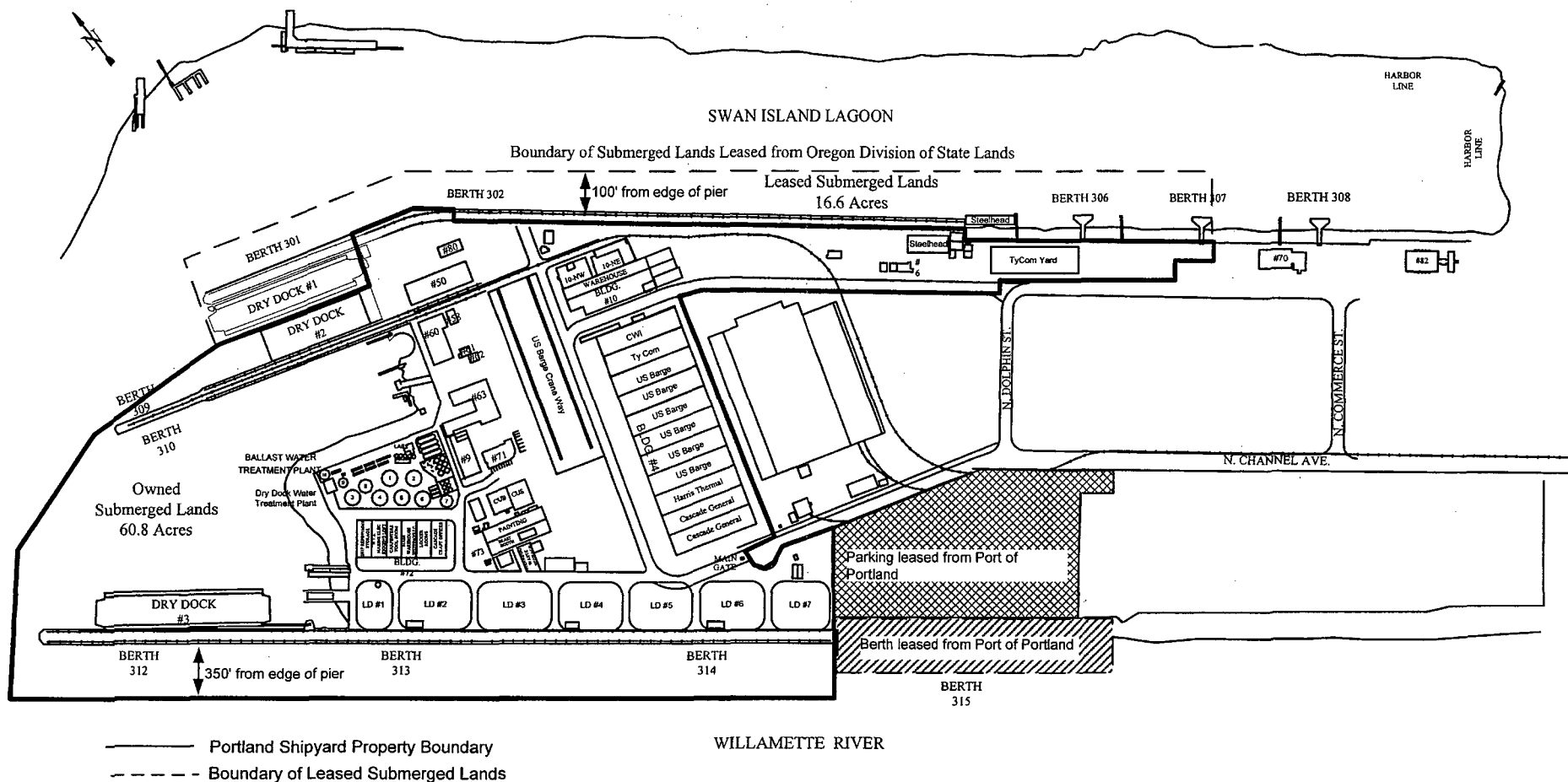
Secondary containment inspection is a routine part of the Ballast Water Treatment Plant operational procedures, and is done at least semi-annually. Discrepancies are noted and action taken to correct the deficiencies. Documentation is maintained by the Support Services Division.

#### **5.4.1 Preventative Maintenance Scheduling and Record Keeping**

Maintenance employees receive task assignments for monthly, quarterly, and annual inspections generated by a computer-based program. They conduct the inspection or preventative maintenance, note the deficiencies and steps taken to correct, and record the work done. This record of work is maintained by the Support Services Division. These records are available for inspection by an appropriate agency. All equipment used for oil transfers is inspected in accordance with 33 CFR 156.170.

#### **5.4.2 USCG Inspections**

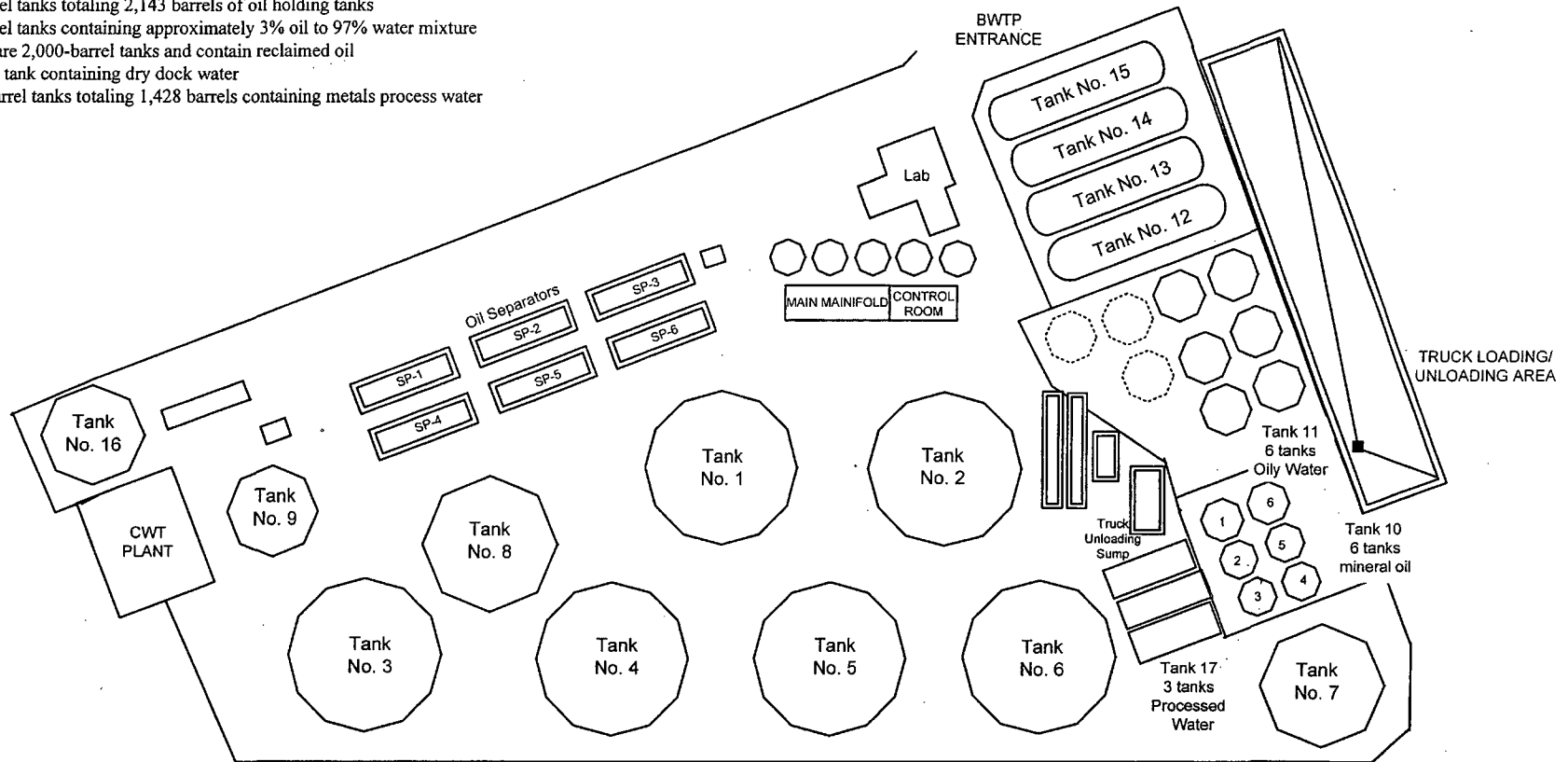
Annual inspections of the transfer equipment (pumps and hoses) are conducted at the request of the United States Coast Guard at a time specified by the Coast Guard. These records are available for inspection by an appropriate agency.





# Notes

- T-1 is a 24,000-barrel tank containing metals water
- T-2 contains approximately 80% oil to 20% water mixture and is 24,000 barrels in capacity
- T-3 through T-6 are 24,000-barrel tanks containing approximately 25% oil to 75% water mixture
- T-7 and T-8 are 15,000 barrel capacity processed water tanks
- T-9 is an 1888-barrel capacity tank used for storing rain water
- T-10 is six 357-barrel tanks totaling 2,143 barrels of oil holding tanks
- T-11 is six 533-barrel tanks containing approximately 3% oil to 97% water mixture
- T-12 through T-15 are 2,000-barrel tanks and contain reclaimed oil
- T-16 is 2,380-barrel tank containing dry dock water
- T-17 is three 476-barrel tanks totaling 1,428 barrels containing metals process water



### Notes

Total Containment Area: Approximately 108,725 sq. ft.

Tanks 12-15 are 1 ft. above ground, actual tank diameter is 15' and length = 75' however, area within avg. containment height (2.88') is 8' x 67' = 536 sq. ft. per tank.

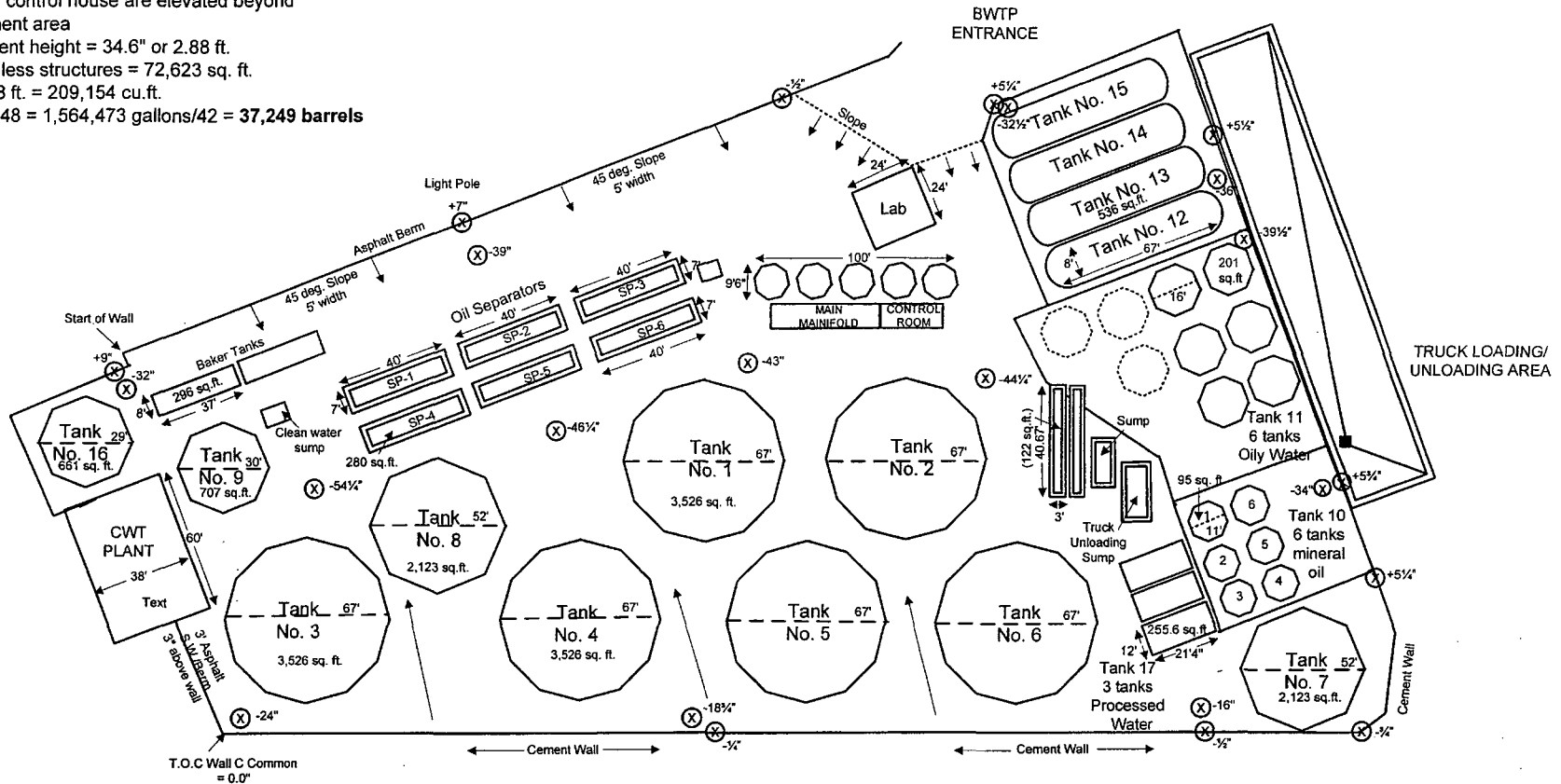
Main manifold and control house are elevated beyond average containment area

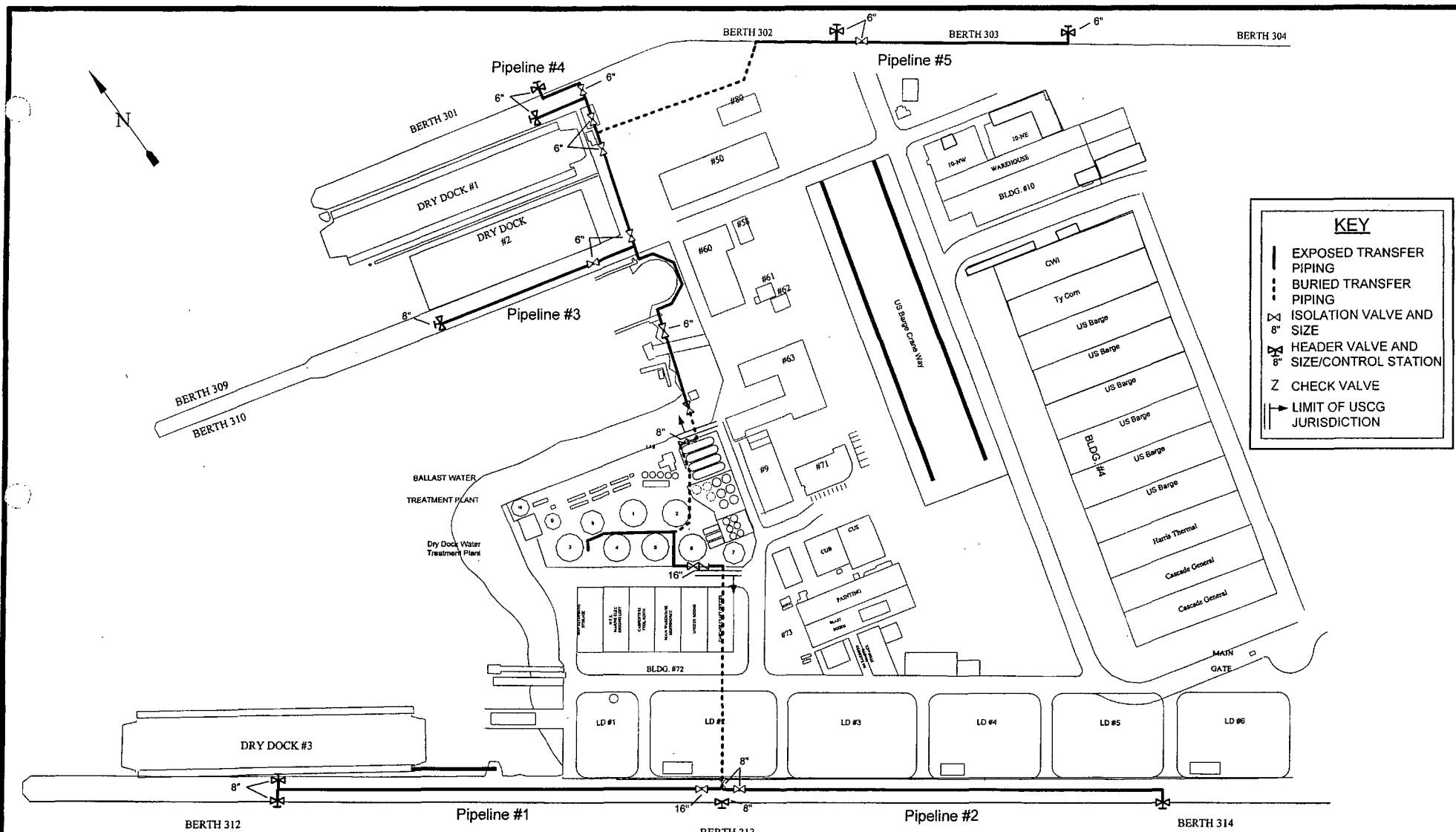
Average containment height = 34.6" or 2.88 ft.

Containment area less structures = 72,623 sq. ft.

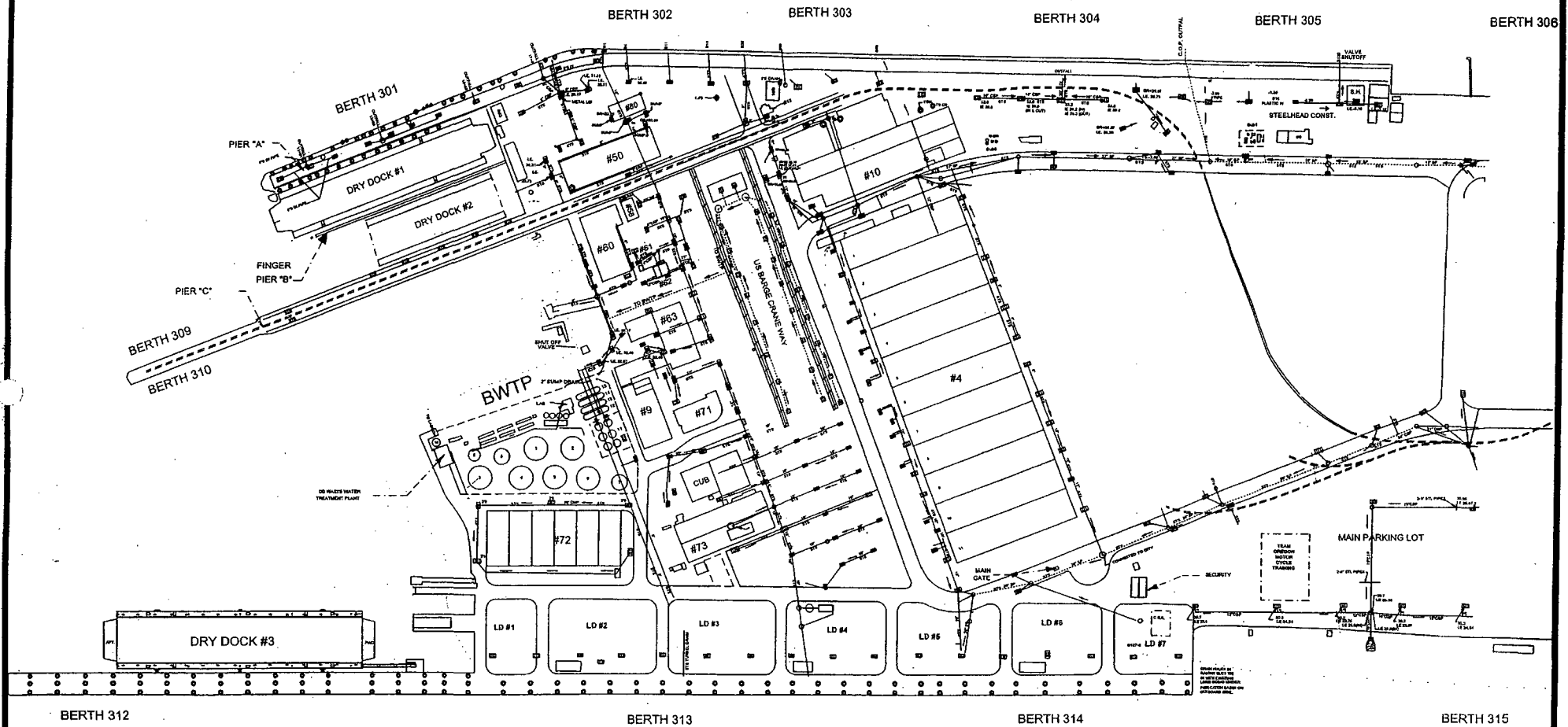
72,623 sq. ft x 2.88 ft. = 209,154 cu. ft.

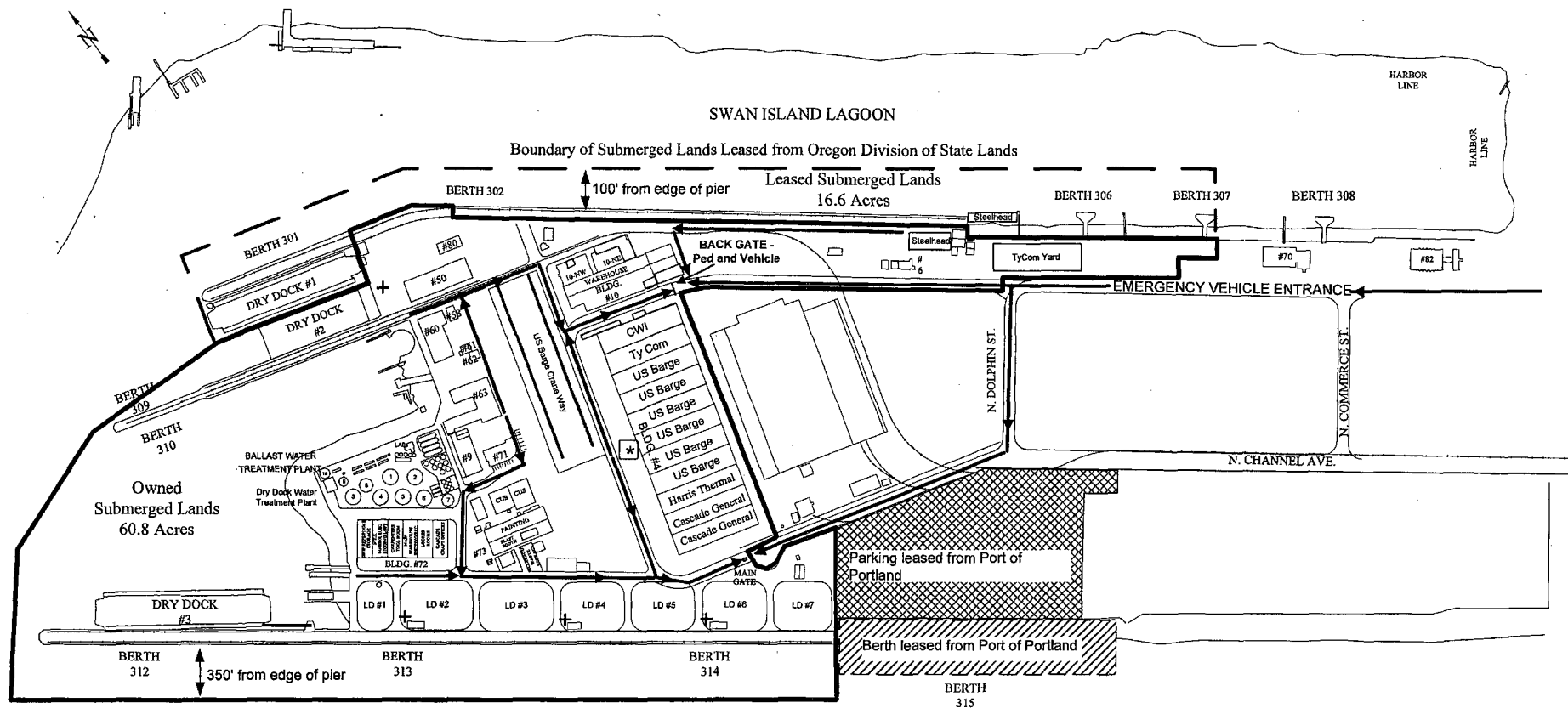
209,154 cu. ft. x 7.48 = 1,564,473 gallons/42 = 37,249 barrels





# SWAN ISLAND BASIN





— Portland Shipyard Property Boundary  
 - - - Boundary of Leased Submerged Lands

\* Horn      → Emergency Entrance  
 + Assembly Areas      → Evacuation Route

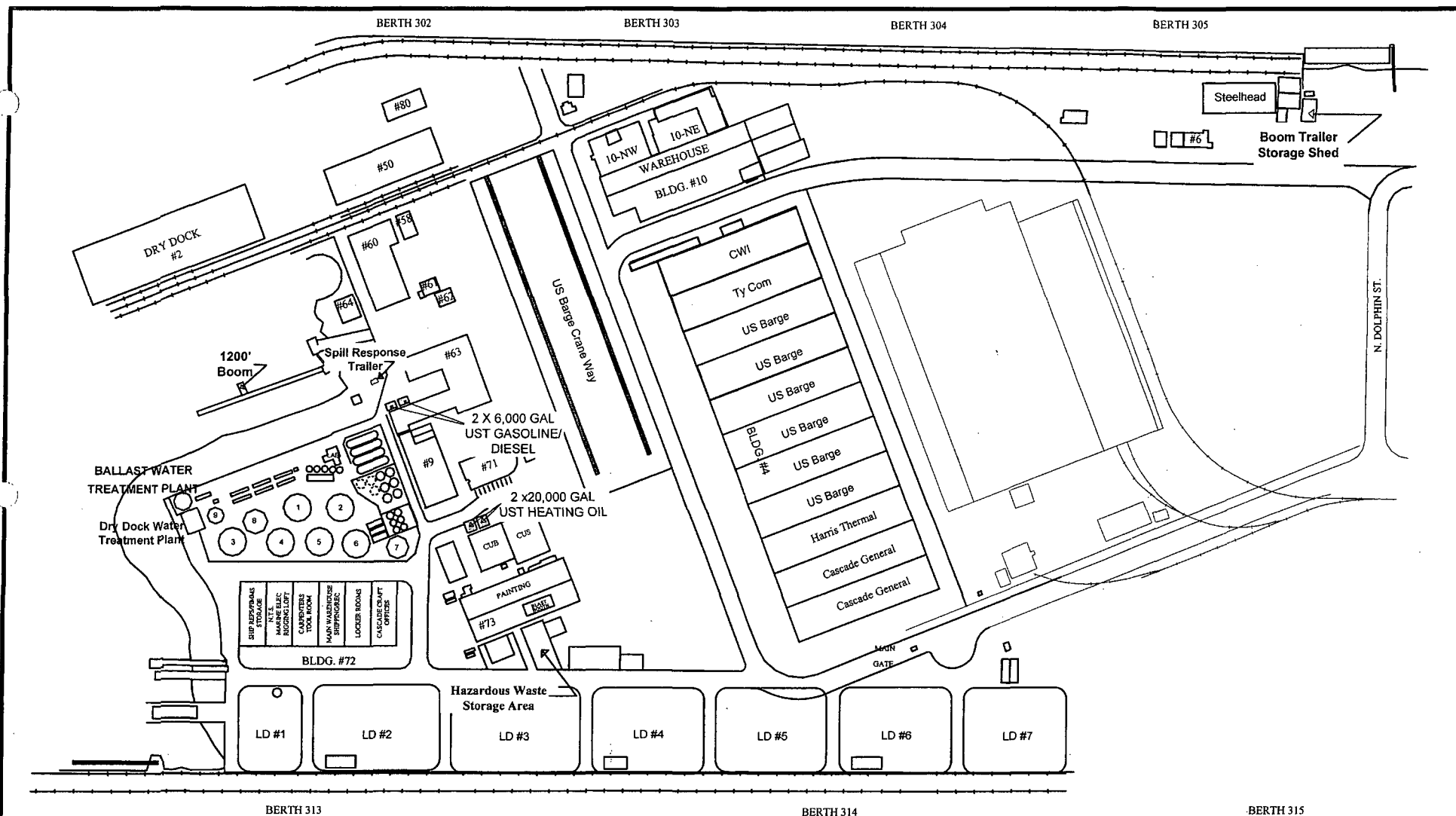
**CASCADE GENERAL**  
 PORTLAND SHIPYARD

APPROXIMATE SCALE: 1" = 400'

## PORTLAND SHIPYARD EVACUATION MAP

FIGURE  
6





## 6.2 List of Contacts

### Internal Emergency Contacts

Contact/Organization	Work Phone	Home Phone	Alternate Number
<b>Primary Emergency Coordinator</b>			
Alan Sprott	(503) 247-1672	[REDACTED]	(503) 703-0875 (cell)
<b>Incident Commanders</b>			
Alan Sprott	(503) 247-1672	[REDACTED]	(503) 703-0875 (cell)
Lian Jewell	(503) 247-1806	[REDACTED]	(503) 781-8161 (cell)
<b>Spill Response Team Members</b>			
Tony Boehm	(503) 247-1670		(503) 880-8761 (cell)
Ken Bonnell	Radio Channel #13		
Jason Brindley	Radio Channel #13		
Michael L. Brungardt	Radio Channel #13		
Adam Bullock	Radio Channel #13		
Roy Bullock	(503) 247-1633		
Paul Cobb	(503) 247-1674		(503) 709-3841 (cell)
Bob Collinson	(503) 247-1634		(503) 539-4859 (cell)
Jerry Hunt	(503) 247-1639	[REDACTED]	(503) 705-4428 (cell)
Jose Moreno	(503) 247-1408		(503) 880-6037 (cell)
Mike Scull	(503) 247-1642		(503) 805-0995 (cell)
Jennifer Senner	(503) 247-1974		(503) 913-6444 (cell)
Bob Taylor	(503) 247-1857		(503) 805-4954 (cell)
Jim L. Snell	Radio Channel #13		
Darren Stevens	Radio Channel #13		
<b>Facility Contacts</b>			
Ken Swingle	(503) 247-1667	[REDACTED]	(503) 702-2292 (cell)
Jerry Hunt	(503) 247-1639	[REDACTED]	(503) 705-4428 (cell)
<b>Main Gate/Security</b>	(503) 247-1799		
Lindsay Docherty	(503) 247-1761	[REDACTED]	(503) 804-8539 (cell)

### External Emergency Contacts

Contact/Organization	Phone Number
<b>Private Cleanup Companies</b>	
West Coast Marine Cleaning, Inc.	(503) 285-2485
NRC Environmental	(503) 283-1150
Clean Rivers Cooperative, Inc.	(503) 220-2040
<b>Local Response Agencies</b>	
Portland Fire Department	911
Portland Police Department	911
Ambulance	911
Emanuel Hospital	(503) 413-2200
<b>Government Agencies</b>	
National Response Center	(800) 424-8802
US Coast Guard	(503) 240-9370
Harbor Master	(503) 823-3767
Oregon Emergency Response Services	(800) 452-0311
DEQ Northwest Region	(503) 229-5263
Portland Bureau of Environmental Services	(503) 823-7180

### ***6.3 CRC, CCS and WCMC Equipment List and Records***

Cascade General, Inc., is a member of the Clean River Cooperative (CRC). It is this cooperative which maintains response equipment for oil spills to the region for which the Plan is intended. Clean Rivers is certified by the US Coast Guard to meet projected spill response requirements not only for Cascade General, but also for other members. Cowlitz Clean Sweep (CCS) is a spill response company contracted by CRC to deploy boom and equipment.

West Coast Marine Cleaning (WCMC) is an independent spill response contractor. The following documentation provides information on the qualifications and resources of these spill responders.

It is the responsibility of these responders to establish protocols and plans for contingencies such as wind, weather, tides and currents in preparing deployment and response actions.

U.S. Department of  
Homeland Security

United States  
Coast Guard



Commander  
National Strike Force Coordination Ctr.

1461 North Road Street  
Elizabeth City, NC 27909  
Staff Symbol:  
Phone: 252-331-6000  
FAX: 252-331-6012

16465

Clean Rivers Cooperative, Inc.  
Attn: Tim Archer  
200 SW Market St.  
Suite 190  
Portland, OR 97201

JAN 16 2007

Dear Mr. Archer,

Your application for classification as an Oil Spill Removal Organization (OSRO) was most recently reviewed and processed, as outlined in the Coast Guard OSRO Classification Guidelines dated 27 April 2001, in November 2004. Our letter to you dated 01 November, 2004, your most recent OSRO Classification Report outlining the classifications you have received, and our contact information is in enclosure (1).

Your classifications are also listed on the OSRO Classification Matrix available on the Internet at:

<http://www.uscg.mil/hq/na/web/nsfcc/ops/Logistics%20Inventory/RRAB/link/osroinfoonclassifiedosro.html>

The Coast Guard is transitioning to a Sector organization which consolidates field operational and marine safety functions; enclosure (2) is a consolidated table that explains the changes affected by this transition.

Thank you for your participation in the OSRO program; your efforts to strengthen our national response capabilities are greatly appreciated.

Sincerely,

A handwritten signature in dark ink, appearing to read "R.T. Gore".

R.T. GORE

Chief, Response Resource Assessment Branch  
U.S. Coast Guard  
By direction

2 Enclosures



U.S. Department of  
Homeland Security

United States  
Coast Guard



Commanding Officer  
National Strike Force  
Coordination Center

1481 N. Road St. (US 17N)  
Elizabeth City, NC 27909  
Staff Symbol:  
Phone: (252) 331-6000  
FAX: (252) 331-6012

16450  
04-0092  
November 1, 2004

Clean Rivers Cooperative, Inc  
Attention: Brent Way  
200 S. W. Market #190  
Portland, OR 97201

Dear Brent Way,

This letter serves as the official statement by the National Strike Force Coordination Center of your classification as an Oil Spill Removal Organization (OSRO) as outlined in the Coast Guard OSRO Classification Guidelines dated 27 April 2001. A copy of this letter will be kept in your company file on these premises. Please feel free to contact my staff anytime you would like to visit and review your file.

Enclosure (1) is a copy of the classification summary sheet that identifies the classifications you received based on the resource data that you provided. This summary contains your classifications by operating area and selected COTP zones. These classifications were determined using core resource and legal/attestation documents you provided. Enclosure (2) contains Response Resource Assessment Branch (formerly the OSRO Branch) and Response Resource Inventory (RRI) contact information.


This notification reflects the information contained in the RRI as of September 23, 2004. Any equipment updates, which may have been submitted by your company in the interim, are not yet reflected in this classification notification. Currently the RRAB is developing processes to more uniformly address common OSRO issues such as changes in company ownership and the acquisition of additional resources. In the event that there is a change in your company's classification, you will receive another letter attesting to your latest classification levels.

A summary of the resource totals for Temporary Storage Capacity (TSC), Effective Daily Recovery Capacity (EDRC), and shoreline protection & containment booming can be forwarded to you upon request. A synopsis of the OSRO Classification standing, along with other useful information, is available on our web site:

<http://www.uscg.mil/hq/nstfweb/nstfcc/ops/OSRO/links/osroinfoonclassifiedosro.html>

If you would like more information regarding your classifications or any other matter, please contact the Response Resource Assessment Branch.

Sincerely,

  
A.M. CRICKARD  
Chief, Logistics Inventory Division  
U.S. Coast Guard  
By direction

2 Enclosures

CRC-2

## Individual OSRO Classification Report

Facilities

Vessels

0092 Clean Rivers Cooperative, Inc

COTP: PORTLAND, OR

☐ High Volume Port

Alternate City:

River/Canal  
Inland  
Open Ocean  
Offshore  
Nearshore  
Great Lakes

MM	W1	W2	W3
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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MM	W1	W2	W3
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

COTP: PORTLAND, OR(COOS BAY, OR)

☐ High Volume Port

Alternate City:

River/Canal  
Inland  
Open Ocean  
Offshore  
Nearshore  
Great Lakes

MM	W1	W2	W3
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
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MM	W1	W2	W3
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<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Check marks indicate that your company has received classifications in the following areas. Please refer to the OSRO Guidelines for a complete discussion of the 4 classification levels that require different minimum amounts for each Environmental operating area.

MMPD(MM) = Maximum Most Probable Discharge

WCD1(W1) = Worse Case Discharge Tier 1

WCD2(W2) = Worse Case Discharge Tier 2

WCD3(W3) = Worse Case Discharge Tier 3

If an asterisk(\*) is displayed after a COTP name, it denotes cities that formerly had COTP authority, but loss that authority and are being considered for designation as an Alternate Classification City(ACC).



STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

PO Box 47600 • Olympia, WA 98504-7600 • 360-407-6000  
TTY 711 or 800-833-6388 (for the speech or hearing impaired)

November 27, 2006

Tim Archer  
General Manager  
200 SW Market, #190  
Portland, OR 97201

Dear Mr. Archer:

The primary response contractor application submitted by Clean Rivers Cooperative, Inc. (CRC) has been approved. Please note that Ecology will use the recovery rates listed on the attached sheet for determining adequacy of contingency plans or drills that utilize CRC skimming and recovery equipment.

If you have any questions regarding your primary response contractor approval please call me at (360) 407-7514 or by email at [nhoa461@ccy.wa.gov](mailto:nhoa461@ccy.wa.gov).

Sincerely,

A handwritten signature in cursive script, appearing to read "Nhi Hoang", followed by a horizontal line.

Nhi Hoang  
Acting Plan Review Unit Supervisor

cc: Kathy Armstrong, WDOE